

Meat Identification and Fabrication- An Introductory Course Guide to Butchery

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Contents

Preface ix

Meat Identification and Fabrication

Topic 1: Chicken Identification and Fabrication	1
Topic 2: Laboratory Production of Poultry	17
Topic 3: Lab - Duck, Ostrich and Game Hens	58
Topic 4: Fin Fish, Flat Fish and Round Fish	61
Topic 5: Beef Identification and Fabrication	101
Topic 6: Veal Identification and Fabrication	143
Topic 7: Pork Identification and Fabrication	151
Topic 8: Midterm examination and Chicken Fabrication Practical	171
Topic 9: Lamb Identification and Fabrication	175
Topic 10: Wild Game Identification and Fabrication	189
Topic 11: Offal Identification and Fabrication	205
Topic 12: International Sausages	219
Topic 13: Shellfish Fabrication	231
Topic 14: Sushi Production	265
Topic 15: Final Offal Project Due	271

Topic 16: Deep Clean. Today is a mandatory graded deep clean day. 275



Notes: 279

Glossary 285

Appendix 319

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Preface

The Meat Identification and Fabrication course is an introductory class that offers you the opportunity to learn how nature made the domesticated and wild animals for us to harvest, fabricate, and prepare for table service. Along the way, we will explore their physiology and muscle composition as we learn how to divide them into primal, sub primal and usable cuts. The goal is not to become a professional butcher after this class but rather to gain a working knowledge about the proteins we use in our profession and to learn how to make sub primals ready for guest service and the proper cooking methods for particular cuts.

By doing this we can increase our skills and profitability, performing some of the labor ourselves instead of paying a higher price per pound to a processor who would otherwise prepare it for us. Doing so offers control over valuable resources and opens menu possibilities that in turn create profit centers for your establishment.

Many **video resources** are available such as the Bovine Myology and Porcine Myology websites at the University of Nebraska. Such websites offer the opportunity for you to see large-scale fabrication on whole animals along with 3-D visual media of the whole carcass from top to bottom.

Charts provided will help you identify the origins of roasts and individual cuts from the proteins studied in class.

Classroom Preparation Assignments will be standard fare for the class and I hope you enjoy it as you enthusiastically explore the world of Meat Identification and Fabrication.

Course Student Learning Outcomes:

1. Describe the physical and chemical composition of meat.
2. Identify quality and yield grades for meat and poultry.
3. Demonstrate the proper fabrication, portion cutting, yields, storage and cooking methods for various cuts of meat, game, poultry and seafood.
4. Discuss primal and sub-primal portions of beef, pork, lamb and veal.
5. Calculate recipe conversions and yields
6. Demonstrate appropriate food safety and sanitation techniques, and proficient knife Skills.

Core Competencies

1. Fabricate primal and sub primal portions of poultry, beef, fish, pork, and lamb into the most commonly used foodservice portions.
2. Apply cooking techniques that are unique to specific protein portions.

3. Work in a group to independently research and present a specific organ protein to the class.

Topic One - Lecture and Lab - Introduction to Poultry

In today's lecture hour, we will discuss the categories of poultry recognized by the USDA. You will be introduced to muscle compositions in a general sense and both dark and white meat types. Poultry discussed will also include ratites such as ostrich, emu, and rhea. Offal, grading, inspection, purchasing, storage, and sanitation will be discussed. Note taking is mandatory.

Once you have finished lecture you will be oriented to the kitchen, the equipment locations, the policies, and procedures of the kitchen.

Topic Two - Laboratory Production of Poultry

In lab today, you will learn to fabricate chicken into airline breasts, leg quarters, leg and thigh pieces, and second joint lollipops. You will also learn to cut a chicken into a standard eight cut for frying. Prior to this class review sanitation procedures from Servsafe®. Pay close attention to successful mise en place before and during fabrication to ensure efficiency and food safety. Some of the production will supply other classes with protein; however, you will be able to roast leg quarters and sauté a portion of the breasts that do not meet industry standards.

Topic Three- Lab - Duck, Ostrich and Game Hens

In lab today, you will learn to fabricate duck into restaurant quality breasts, legs for confit and reserve the offal (heart, liver, gizzards) for the same. You will render the excess fat from the duck, cure the legs briefly and confit the legs and offal. The bones and neck will be used for stock while some of the breasts will be prepared with a lavender and spice crust and served with potato 'dauphinoise'.

Topic Four - Fin Fish, Flatfish and Round Fish

Lecture today will concentrate on the structures and composition of flat and round fish. We will learn to identify a variety of both round and flat fish. You will learn to fabricate flat fish into four fillets and round fish into two fillets. Some salmon fillets will be used by the Garde Manger class for curing, and smoking while you prepare some 'en papillote'. The flounder will be sautéed 'meuniere' style.

Topic Five - Beef Identification and Fabrication

Lecture today will deliver vital information on the primal and sub primal cuts of beef. Integral to this is the knowledge of where common cuts at the restaurant level are derived. Organ meats will be discussed as well as the three types of fat found in beef. We will see a demonstration on cleaning and cutting a beef tenderloin, a boneless striploin, and a rib roast. Select cuts of today's production may be cooked according to provided recipes.

Topic Six - Veal Identification and Fabrication

Lecture today will deliver information about veal. We will discuss the three age and weight categories of special fed, grain fed, and “Bob veal”. Primal, sub primal, and organ meats will be discussed along with cooking methods of veal. A variety of veal dishes will be prepared today.

Topic Seven - Pork Identification and Fabrication

We will identify the primal, and sub primal cuts of pork and learn to make several cuts from the sub primal loin including pork chops, frenched chops, boneless pork loin, and back ribs. The sub primal cuts will teach us the origin of our commonly used cuts. Some cuts will be available to cook.

Topic Eight - Midterm examination and Chicken Fabrication Practical

Your midterm exam on each subject cover thus far will be administered today. You will also be graded on chicken fabrication.

Topic Nine - Lamb Identification and Fabrication

Lecture will offer the opportunity to learn about lamb primals, sub primals, and fabricated cuts for restaurant service. The differences between domestic and imported Lamb is covered along with the cooking methods and classic lamb flavors that lend itself to this pleasantly gamey meat. You will learn to fabricate the always-popular ‘frenched’ rack of lamb.

Topic Ten - Farm Raised Game

Ground game, winged game, and reptiles are up for discussion in this class. Small game, feathered, furred, large game, big game, birds, frogs, exotic, and snakes are all fair game- pardon the pun. We will break down rabbits and braise them. Next, we will grill bison burgers and quail. Beautiful plates are made in this class.

Topic Eleven - Offal Sometimes Called Variety Meats

From chicken, turkey, duck, beef, veal, pork, and lamb come a wide variety of organ meats, cooking methods and flavor profiles. You will be exposed to recipe ideas and flavors that will inspire you to create a personalized project that you will be graded on. Your team assignment is to arrive in class next week with your idea and grocery needs for your project.

Topic Twelve - International Sausages

Sausage making in CULA 219 focuses on the sausages that Garde Manger does not make. You will learn to make German Frankfurters, Ring Kielbasa, Beer Bratwurst, and German Schuebling. The same principles of sausage making are covered in the text and it would be a good idea to review.

Topic Thirteen - Shellfish Fabrication

Mollusks, univalves, bivalves, cephalopods, and crustaceans are covered along with fabrication demonstrations and recipes for class.

Topic Fourteen - Sushi Production

This week you will learn about making sushi rolls, Nigiri, and miso soup. This is a favorite among some students and a good class to have before your final projects next week.

Topic Fifteen - Final Offal Project Due

This is a team research project that will offer something for everyone on your team. Write a paper about your chosen offal; cook the offal on the project day and present an entrée serving plate up and a family platter for sampling.

Topic Sixteen - Deep Clean. Today is a mandatory graded deep clean day.

Topic One:
Chicken Identification and Fabrication

Called Poulet in France, the domesticated chicken is the most prevalent bird raised for eating in the world. Though once raised for other purposes, chicken began to be raised for consumption during the Hellenistic period between the 4th and 2nd centuries B.C.E. Chicken is relatively inexpensive, contains both light and dark meat, and is relatively lean. It is available fresh and frozen today in a variety of forms. It has been said that chicken is the palate for the chef because of its versatility adapting too many flavor combinations.

The muscle composition of chicken is approximately 72% water, 20% protein, 7% fat, and 1% minerals. Chicken has no marbling of the meat therefore no intramuscular fat. The fat of a chicken is stored under its skin and in the abdominal cavity. Chicken fat has a lower melting point than other animal fats and is widely used in Jewish cooking where it is referred to as "*Schmaltz*". Rendered chicken fat is easy to keep refrigerated and sealed in containers for a flavorful cooking fat that can positively affect the food budget.

Dark meat is found in the leg and thigh, and contains myoglobin, an oxygen binding protein for muscle use. Dark meat also contains more fat and connective tissue than light meat, therefore it requires longer cooking time than white meat and leans itself well to roasting and braising.

Classifications:

- **Game hens** - raised five weeks or less.
- **Broiler/fryer** - raised 10 weeks or less.
- **Roaster** - raised between 8 and 12 weeks.
- **Capon** – 4 - 8 months
- **Hens/ stewing** - over ten months

Game Hens



Game Hens from commons. Wikimedia.org

Game hens are the young or immature progeny of Cornish chickens and white Rock chickens. They are very flavorful and weight one to two pounds. French refer to these as 'Poussin'. These little hens can be split and broiled, grilled or trussed and roasted whole. A friend of mine from Idaho once prepared a delicious roasted Cornish Game Hen with Amaretto that was superb.

Broilers and Fryers

These birds are young with soft, smooth textured skin, and are relatively lean. They generally weigh three and a half pounds or less. You may use any method to cook broilers and fryers. One popular method for the recent resurgence in grilling is "*spatchcocking*" which is a way of cutting out the back bone, breaking the breast bone, and removing the breast cartilage. The bird is then seasoned and grilled under a brick and turned to complete the cooking.



Grilled spatchcocked chicken- commons.wikimedia.org

Capon

These can be difficult to find and once were the darling of the Garde Manger for cold platter use with Chaud Froid. Capons are the surgically castrated male chickens (roosters) which are fattened for consumption. They are bred for flavor and have a high proportion of light to dark meat. They weigh between 5-7 pounds and are often roasted.



"Capon a la Godard". Engraving from Charles Elmé Francatelli's
The Modern Cook. 28th edition, 1886



Capons- commons.wikimedia.org

Duck

The French call this wonderful bird “*Canard*”. They can be harvested from the wild when the lawful hunting season is in, but today we have year round access to beautifully farm raised duck products from whole birds to specialty pates. Ducks are exclusively dark meat but we must treat the breast meat and leg meat as if they are two different animals. Contrary to food safety rules, we never cook duck breasts to 165°F in the restaurant. If we did, it would be dry and taste like liver. The breast again, is red meat and can be sautéed rare to medium rare. The legs on the other hand must be well done to be tender enough to eat. This can be accomplished by braising, roasting or stewing.

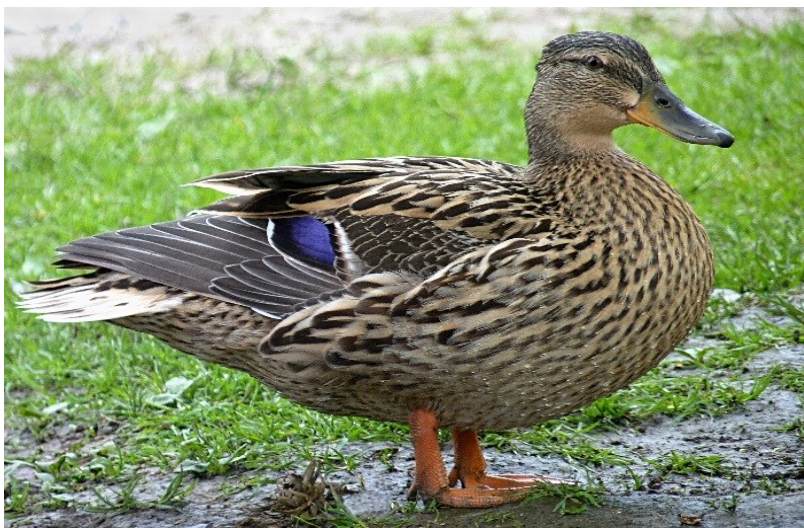
Ducks have a tremendous amount of fat as nature’s buoyancy device to keep this waterfowl afloat. The fat is referred to as “*white gold*” and is always rendered to use as cooking fat for confit of duck and Pommes de Terre Sarladaises. They also have a high ‘bone-to-meat’ ratio, which makes for making great stock once fabricated. The three primary ducks we eat are **Muscovy**, **Mallard**, and **Pekin**.



Muscovy duck - commons.wikimedia.org



Pekin ducks - commons.wikimedia.org



Mallard duck - commons.wikimedia.org

Geese

Goose is a wonderful bird often roasted for popular holidays with acidic fruit based sauces known as a gastrique. This type of sauce offsets the fattiness of this succulent waterfowl. Geese are divided into two classes of young and mature. They as do duck only contain dark meat.



Canadian goose- commons.wikimedia.org



Roasted Christmas Goose - Fen. Wikimedia.org

Guinea Fowl

These birds, like geese, are divided into young and mature classifications. They are the descendants of a game bird and have both light and dark meat. The breasts are tender enough to sauté, but the bird is so lean that it helps to lard or bard the bird when roasting. The French call this bird Pintade.



Guinea fowl- commons.wikimedia.org

Pigeon

Though pigeons can be eaten at any size or age, we usually refer to the young pre-flight pigeons as squab. They are very popular in Persian restaurants. Pigeons only contain dark meat and is very tender even



Pigeon and squab plated- commons.wikimedia.org

Turkey

The French call turkey “**Dinde**” and they love it. Turkey in fact is not indigenous to France and was first brought to the Old World after the Americas were discovered. Turkey has four classifications.

- Fryer/roaster
- Young
- Yearling
- Mature

Turkey is the second most popular category of poultry in the U.S. behind chicken. It contains both light and dark meat and relatively low in fat. Turkey can be roasted and young turkeys can be prepared with a variety of methods. Many people make ‘pillards’ of turkey to bread and sauté as you would veal for schnitzel. I like to make tornedoes from the tenders for turkey mignons. Braised turkey potpies are a comforting dish in the fall and winter. Wild and farm raised turkeys are different in appearance and flavor.



Wild gobbler- commons.wikimedia.org



Farm raised turkeys - [www.public domain files.com](http://www.publicdomainfiles.com)

Ratites

Ratites are a family of flightless birds with small wings and flat breast bones. They include the **Ostrich**, **Emu**, and **Rhea**. Each are classified as a red meat and are low in fat and cholesterol. The most delicious of the three is Ostrich and they can be prepared in any way that you would prepare the lean delicate meat of veal.



Ostrich- commons.wikimedia.org



Emu- commons.wikimedia.org



Rhea- commons.wikimedia.org

Poultry Offal

Also known as giblets, these parts of the bird include the gizzards, hearts, livers, and necks. Livers are often sautéed, broiled, or used in pates. Gizzards are the second stomach and act as a grinding mechanism for their food; they are often fried as are livers in the South. Hearts are sometimes sautéed or creamed. The Garde Manger sometimes confits these parts and uses them to inlay as a garnish within pate. The necks are used for stock with the remaining carcasses. Sometimes southern cooks pick the meat from the neck to add into cornbread dressing or to make a cornstarch thickened giblet gravy with stock, giblets, and boiled eggs.



Duck giblets- neck, liver, heart, and gizzard. commons.wikimedia.org

Inspection

All poultry produced for public inspection is inspected by the USDA. It must be processed under strict sanitary guidelines and must be fit for human consumption.

Grading Poultry

USDA grades for poultry are **A, B, and C**

Grade “A” poultry is free of deformities and pinfeathers, free of cuts, tears, and broken bones. It has a thick flesh with a well-developed fat layer.

Grades B and C are used primarily for processed poultry products.



USDA inspection and grade - publicdomainefiles.com

Royalty of Poultry Offal - Foie Gras

Larger duck and geese are gavage fed in order to develop a fattened liver which is considered a delicacy. The harvesting of the animal is sustainably used and the breast from these birds are called *magret (may-gray)* and are usually quite large, boneless and with skin intact.

As of late the discussion regarding the raising practices have been met, especially on the West coast, with protest sponsoring a California ban on the serving of foie gras. There may have been a time in our culture when poor practices have been used, however that day is past. Reputable farms have opened their doors to the activist community and educated many on the humane principals and low stress practices in raising and harvesting these birds. Still you will hear that the livers are diseased by over feeding. This is only an uneducated assumption. In the wild these ducks and geese must forage for food in a hurried manner to avoid their natural predators while at the same time, fattening those same livers for energy needed in their long seasonal migrations. Man simply mimics nature in the raising of geese and ducks for this prized and sustainable food as he has since the times of the ancient Egyptians. You must make up your own mind in your future decisions regarding foie gras service. It is your decision as a chef.

Foie Gras can be made into a 'torchon', or sliced, and seared. When making pate or torchons, you must remove the veins inside of the liver. This is done carefully by separating the lobes (there are two on each liver). Then rub the inner section to warm the fat. Work a knife edge and your fingers to expose the system of veins that run throughout the liver. Peel out the veins and remove them as they are unpleasant when eating.

When searing foie gras carefully slice a section from the liver in a thickness of $\frac{1}{2}$ of an inch. Mark one side with a knife-edge in a crisscross manner. Sear the crisscrossed side first in a hot pan until golden brown then repeat on the other side. No oil is necessary as the foie gras releases much fat as it sears. Reserve the remaining fat for other applications. More on Foie Gras latter.



Torchons hanging after poaching- photo credit: Marshall Welsh CEC



*Torchon of foie gras on toast with pistachio butter, strawberry jam and fleur de sel
Photo credit: Chef Thomas Numprasong*



Seared Foie gras with truffles- commons.wikimedia.org



Whole Raw Foie Gras- commons.Wikimedia.org

Purchasing and Storage

As always, purchase from approved reputable suppliers. Purchasing whole and fabricating yourself will save you money, but it can be labor intensive. If I am frying large quantities of chicken, I find it best to purchase in cut cases. For finer dinning where an airline breast is needed, your knife skills will usually be superior to that of a pre-cut breast.

When storing poultry under refrigeration, use drip pans and bagged ice over the top of the chicken. The drip pan allows the water to drip away from the product and the ice keeps it colder than the refrigeration. Remember that poultry is highly perishable and if frozen is best thawed under refrigeration.

Classroom Preparation Assignment

Topic One - Poultry

Name: _____ Date: _____

1. Name the six categories of poultry recognized by the USDA.
2. Insert the proper % found in each of the components of chicken listed below.
Water- _____, Protein- _____, Fat- _____, Minerals- _____.
3. Why does dark meat take longer to cook?
4. Name two excellent ways to cook dark meat poultry.
5. Why is chicken referred to as the palate for the chef?
6. Match the following:

A. Game Hen- _____.	1. Over 10 months old.
B. Broiler/ Fryer _____.	2. 4-8 months old/
C. Roaster _____.	3. 8-12 weeks old
D. Capon _____.	4. 10 weeks or less
E. Hen/ Stewing	5. 5 weeks or less.
7. What are the three types of duck from your text?
8. What must you do in preparation to roast a Guinea Fowl?
9. A young flightless pigeon is called a _____ and is popular in _____ restaurants and cuisine.
10. Which bird is not indigenous to France but is a favorite after coming back to the old world after Columbus discovered the Americas?
11. Name the three ratites discussed in Topic One.

12. What is the Royalty of Poultry offal?
13. What are the three grades of poultry by the USDA?
14. Name three forms in which we may purchase poultry. 15. Describe storing poultry.

Topic Two:
Laboratory Fabrication of Poultry

Sanitation is a key issue today due to the presence of salmonella bacteria associated with chicken. Therefore, be mindful of your food safety course principles learned in your first semester and adhere to good sanitation principles throughout class.

A well-organized station will keep you on track and aid in your organizational and sanitation skills. Below is an example of a properly organized station for chicken fabrication.



Photo courtesy of Marshall Welsh CEC

Clockwise from top left:

1. **Recipe** - covered with plastic film for Sharpie® notes and protection.
2. **Butcher twine** in a **1/6 pan** for sanitation and protection
3. **Cheese cloth** - necessary if making galantine
4. **Half sheet pan** with ½ sheet of **parchment paper** for fabricated parts and evaluation
5. **Chicken in a half pan over ice.**
6. **Sanitized yellow cutting board** with **wet towel** under for safety
7. **Necessary tools on a folded towel.** Note: Sanitizer stored below table is mandatory.

Often the first step in preparing poultry is to cut the bird in half. Broiler and fryer chickens are often split to make two portions. This procedure removes the backbone and breast bone (also known as the keel bone) for a neat finished product. The backbone, breastbone, and wing tips may be reserved for stock.

This is a favorite for Southern Barbecued Chicken and a brine will add a flavor and moisture that will separate you from the competition. When brining chicken, limit the time these chicken halves stay in the brine to 24 hours. After this, pat them to dry with paper towels and allow them

to form a pellicle in the cooler for several hours under refrigeration. At this point they are ready for grilling and smoking. Resist the temptation of brushing with your favorite barbecue sauce until late in the stages of cooking as the sauce contains sugar and can burn chicken in halves.

See in class demonstration on Chicken Fabrication.

Poultry Cuts - general information

Poultry refers to the edible flesh, with adhering bones, of any bird that is commonly used as food. Types of poultry include chickens, ducks, geese, turkey, quail, and pheasant. All poultry is processed in a similar manner. It is either cooked whole, or segmented in a number of ways depending on usage.

All segments of small, young poultry can be prepared using dry heat cooking methods. Older birds, once they stop laying eggs, are butchered and marketed as stewing hens, or boiling fowl. These birds need moist heat preparation and are ideal for pot pies, stews, and soups. All poultry should be fully cooked to at least 74°C (165°F) to eliminate the presence of salmonella.

United States Department of Agriculture (USDA) Classes of Chicken

Game hen	Young or immature progeny of Cornish chickens or of a Cornish chicken and a White Rock chicken; very flavorful	5-6 weeks	Split and broil or grill; roast	2 lb. (1 kg) or less
Broiler/fryer	Young with soft, smooth-textured skin; relatively lean; flexible breastbone	13 weeks	Any cooking method; very versatile	3 lb. 8 oz. (1.5 kg) or less
Roaster	Young with tender meat and smooth-textured skin; breastbone is less flexible than broiler's	3-5 months	Any cooking method	3 lb. 8 oz.-5 lb. (1.5-2 kg)
Capon	Surgically castrated male; tender meat with soft, smooth-textured skin; bred for well-flavored meat; contains a high proportion of light to dark meat and a relatively high fat content	Under 8 months	Roast	6-10 lb. (2.5-4.5 kg)
Hen/stewing	Mature female; flavorful but less tender meat; nonflexible breastbone	Over 10 months	Stew or braise	2 lb. 8 oz.-8 lb. (1-3.5 kg)

A bird can be split in half lengthwise through the backbones and keel bone, or it can be split into a front quarter and a hindquarter. The front quarter of the bird contains the breast and wing meats, while the hindquarter contains the legs. It is common to continue to break the poultry into segments.

For maximum yield and precise processing, poultry can be segmented by cutting through the soft natural joints of the bird. The term *8-cut chicken* is used to describe a chicken segmented into two drumsticks, two thighs, and both breasts split in half across the rib bone (one half may contain the wing). This procedure is always done with the bone in. These segments can be processed further to boneless skinless cuts if desired. Figure 29 shows a fully segmented frying chicken.



Figure 29. Segmented frying chicken.

Photo by TRU Meat cutting department shared under CC-BY-NC 4

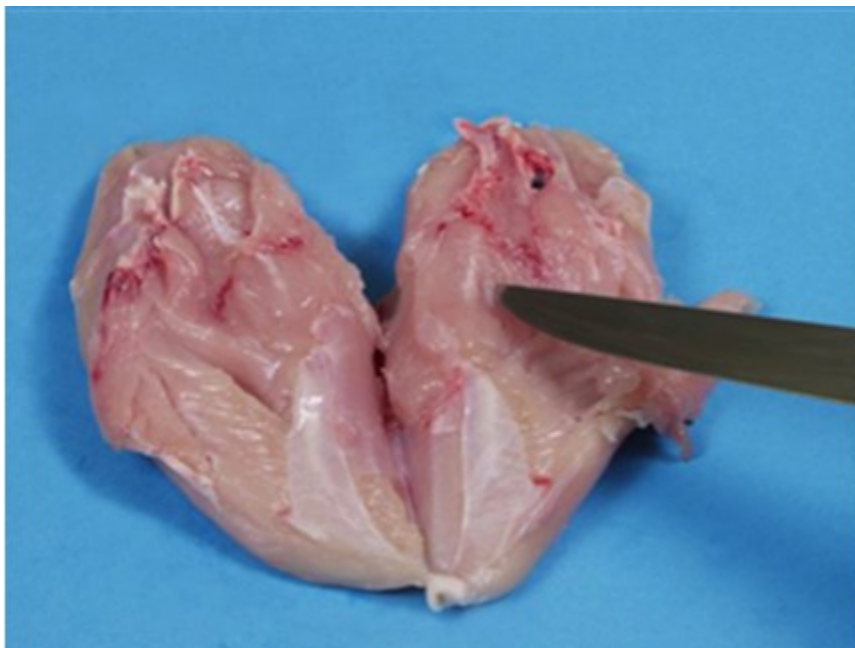
White Meat Cuts

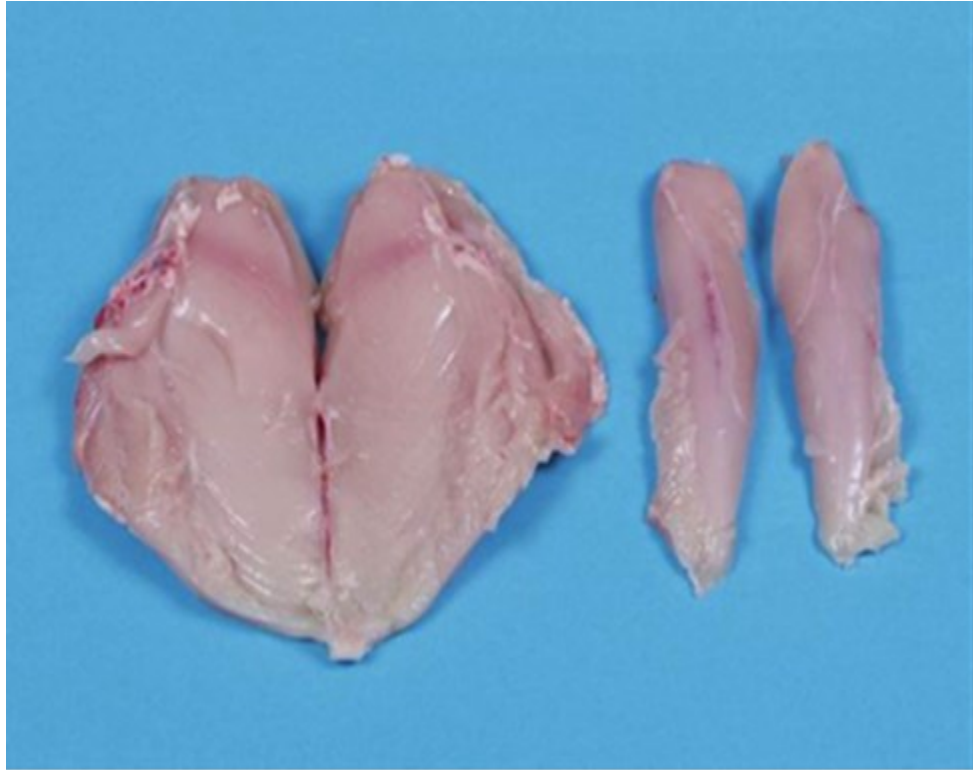
White or light meat comes from the breast and wings. The breast and wings are generally separated, but a chicken breast with the drumette portion of the wing still attached is called a **supreme.** Wings can be broken down into three parts: wing tip, winglet, and wing drumette



Figure 30. Segmented chicken wing. Photo by Jakes and Associates shared under CC-BY-NC 4.0

The breast can also be broken down further and the tenderloins (fillets) removed. The portion without the tenderloin can be split and pounded into a thin cutlet known as a **pillards**. Figure 31 shows the chicken breast whole and with the fillets removed from the bottom portion.





*Figure 31 Boneless skinless chicken breast with fillets removed.
Photo by Jakes and Associates shared under CC- BY-NC 4.0*

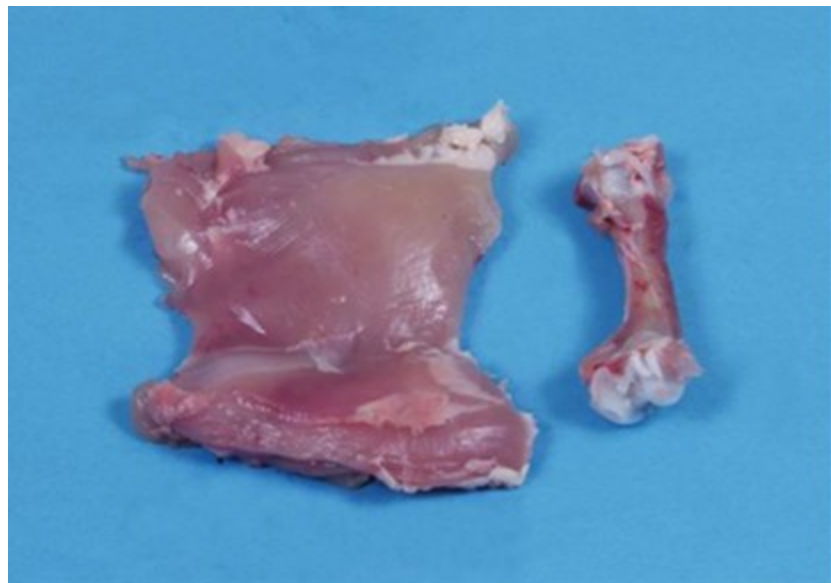
Dark Meat Cuts

The dark meat poultry comes from the legs, which can be broken down into two parts: the thigh and the drumstick. In restaurants, you may occasionally find a boneless leg that has been stuffed, which is called a **Ballotine**.

Chicken legs are split at the knee joint to separate the thigh from the drumstick. Drumsticks are usually cooked bone in, while thighs can be deboned and skinned to use in a variety of dishes, including slicing or dicing for stir-fry and similar dishes.

Figure 32 shows a whole chicken leg broken down into a drumstick and boneless thigh.





*Figure 32 Breakdown of chicken leg.
Photo by Jakes and Associates shared under CC-BY-NC*

POULTRY

Poultry is the collective term for domesticated birds bred for eating. They include chickens, ducks, geese, guineas, pigeons and turkeys. Poultry is generally the least expensive and most versatile of all main-dish foods. Almost any cooking method is applicable, and its mild flavor goes well with a wide variety of sauces and accompaniments.

Poultry also includes other birds killed for their meat, such as the young of pigeons (known as squabs) but does not include similar wild birds hunted for sport or food and known as game. The word "poultry" comes from the French/Norman word *poule*, itself derived from the Latin word *pullus*, which means small animal.

The domestication of poultry took place several thousand years ago. This may have originally been a result of people hatching and rearing young birds from eggs collected from the wild, but later involved keeping the birds permanently in captivity. Domesticated chickens may have been used for cockfighting at first and quail kept for their songs, but soon it was realized how useful it was having a captive-bred source of food.

Selective breeding for fast growth, egg-laying ability, conformation, plumage and docility took place over the centuries, and modern breeds often look very different from their wild ancestors. Although some birds are still kept in small flocks in extensive systems, most birds available in the market today are reared in intensive commercial enterprises.

Together with pig meat, poultry is one of the two most widely eaten types of meat globally, with over 70% of the meat supply in 2012 between them; poultry provides nutritionally beneficial food containing high-quality protein accompanied by a low proportion of fat. All poultry meat should be properly handled and sufficiently cooked in order to reduce the risk of food poisoning.

In this section, we discuss the different kinds and classes of poultry, and how to choose those that best suit your needs. You will learn how to store poultry properly to prevent food-borne illnesses and spoilage, how to butcher birds to produce the specific cuts you need, and how to apply a variety of cooking methods properly.

Many of the cooking methods discussed here apply to previously to meats. Although there are similarities with these methods, there are also many distinct differences.

MUSCLE COMPOSITION

The muscle tissue of poultry is similar to that of mammals in that it contains approximately 72 percent water, 20 percent protein, 7 percent fat and 1 percent minerals; it consists of bundles of muscle cells or fibers held together by connective tissue. Unlike red meat, poultry does not contain the intramuscular fat known as marbling. Instead, a bird stores fat in its skin, its abdominal cavity and the fat pad near its tail. Poultry fat is softer and has a lower melting point than other animal fats. It renders easily during cooking.

As with red meats, poultry muscles that are used more often tend to be tougher than those used less frequently are. In addition, the muscles of an older bird tend to be tougher versus those of a younger one. Because the majority of poultry reaches the market at a young age, it is generally very tender.

United States Department of Agriculture (USDA) Classes of Chicken

Class	Description	Age	Weight	Cooking Method
Game hen	Young or immature progeny of Cornish chickens or of a Cornish chicken and a White Rock chicken; very flavorful	5-6 weeks	2 lb. (1 kg) or less	Split and broil or grill; roast
Broiler/fryer	Young with soft, smooth-textured skin; relatively lean; flexible breastbone	13 weeks	3lb.8oz.(1.5kg) or less	Any cooking method; very versatile
Roaster	Young with tender meat and smooth-textured skin; breastbone is less flexible than broiler's	3-5 months	3 lb. 8 oz.-5 lb. (1.5-2 kg)	Any cooking method
Capon	Surgically castrated male; tender meat with soft, smooth-textured skin; bred for well-flavored meat; contains a high proportion of light to dark meat and a relatively high fat content	< 8 months	6-10 lb. (2.5-4.5 kg)	Roast
Hen/stewing	Mature female; flavorful but less tender meat; nonflexible breastbone	Over 10 months	2 lb. 8 oz.-8 lb. (1-3.5 kg)	Stew or braise

The breast and wing flesh of chickens and turkeys is lighter in color than the flesh of their thighs and legs. This color difference is due to a higher concentration of the protein myoglobin in the thigh and leg muscles. Myoglobin is the protein that stores oxygen for the muscle tissues to use. More reactive muscles require more myoglobin and tend to be darker than less active ones. Because chickens and turkeys generally do not fly, their breast and wing muscles contain little myoglobin and are therefore a light color. Birds that do fly have only dark meat. Dark meat also contains more fat and connective tissue than light meat, and its cooking time is longer.

Skin color may vary from white to golden yellow, depending on what feed the bird consumed. Such color differences are not an indication of overall quality.

Identifying Poultry

The USDA recognizes six categories or kinds of poultry: chicken, duck, goose, guinea, pigeon and turkey. Each kind of poultry is divided into classes based predominantly on the bird's age and

tenderness. The sex of young birds is not significant for culinary purposes. It does matter, however, with older birds; older male birds are tough and stringy and have less flavor than older female birds. The previous table lists identifying characteristics and suggested cooking methods for each of the various kinds and classes of poultry.

CHICKEN

Chickens are medium-sized, chunky birds with an upright stance and characterized by fleshy red combs and wattles on their heads. Males, known as cocks, are usually larger, more boldly colored, and have more exaggerated plumage than females (hens). Chickens are gregarious, omnivorous, ground dwelling birds that in their natural surroundings search among the leaf litter for seeds, invertebrates, and other small animals. They seldom fly except as a result of perceived danger, preferring to run into the undergrowth if approached.

Today's domestic chicken (*Gallus gallus domesticus*) is mainly descended from the wild red jungle fowl of Asia, with some additional input from grey *junglefowl*. Domestication is believed to have taken place between 7,000 and 10,000 years ago, and what are thought to be fossilized chicken bones have been found in northeastern China dated to around 5,400 BC. Archaeologists believe domestication was originally for the purpose of cockfighting, the male bird being a doughty fighter. By 4,000 years ago, chickens seem to have reached the Indus Valley and 250 years later, they arrived in Egypt. They were still used for fighting and were regarded as symbols of fertility. The Romans used them in divination, and the Egyptians made a breakthrough when they learned the difficult technique of artificial incubation. Since then, the keeping of chickens has spread around the world for the production of food with the domestic fowl being a valuable source of both eggs and meat.

Chicken is the most popular and widely eaten poultry in the world. It contains both light and dark meat and has relatively little fat. A young, tender chicken can be cooked by almost any method; an older bird is best stewed or braised. Chicken is extremely versatile and may be seasoned, stuffed, basted or garnished with almost anything. Chicken is inexpensive and readily available, fresh or frozen, in a variety of forms.

The French Poulet de Bresse is a special category of chicken, frequently touted, as the world's finest. The only certified-origin chicken in the world, it is a blue-legged variety raised near the village of Bresse in southeastern Burgundy. These are free-range birds fed a special diet of milk products plus sweet corn and other grains. An identifying leg band is attached to each young chick, and authentic birds will be sold with the banded leg attached. They are available in the United States, at a premium price, from specialty food importers.

DUCK

Ducks are medium-sized aquatic birds with broad bills, eyes on the side of the head; long necks, short legs set far back on the body, and webbed feet. Males, known as drakes, are often larger

than females (simply known as ducks) and are differently colored in some breeds. Domestic ducks are omnivores, eating a variety of animal and plant materials such as aquatic insects, worms, small amphibians, waterweeds, and grasses. They feed in shallow water by dabbling, with their heads underwater and their tails upended. Most domestic ducks are too heavy to fly, and they are social birds, preferring to live and move around together in groups. They keep their plumage waterproof by preening, a process that spreads the secretions of the preen gland over their feathers.

Pekin ducks

Clay models of ducks found in China dating back to 4000 BC may indicate the domestication of ducks took place there during the *Yangshao* culture. Even if this is not the case, domestication of the duck took place in the Far East at least 1500 years earlier than in the West. Lucius Columella, writing in the first century BC, advised those who sought to rear ducks to collect wildfowl eggs and put them under a broody hen, because when raised in this way, the ducks "lay aside their wild nature and without hesitation breed when shut up in the bird pen". Despite this, ducks did not appear in agricultural texts in Western Europe until about 810 AD, when they began to be mentioned alongside geese, chickens, and peafowl as being used for rental payments made by tenants to landowners. It is widely agreed that the mallard (*Anas platyrhynchos*) is the ancestor of all breeds of domestic duck (with the exception of the Muscovy duck (*Cairina moschata*), which is not closely related to other ducks).

Ducks are farmed mainly for their meat, eggs, and down. As is the case with chickens, various breeds have been developed, selected for egg-laying ability, fast growth, and a well-covered carcass. The most common commercial breed in the United States is the Pekin duck, which can lay 200 eggs a year, and can reach a weight of 3.5 kg (7.7 lb.) in 44 days.

In the Western world, ducks are not as popular as chickens, because the latter produce larger quantities of white, lean meat and are easier to keep intensively, making the price of chicken meat lower than that of duck meat. While popular in haute cuisine, duck appears less frequently in the mass-market food industry. However, things are different in the East. Ducks are more popular there than chickens and are mostly still herded in the traditional way and selected for their ability to find sufficient food in harvested rice fields and other wet environments.

United States Department of Agriculture (USDA) Classes of Duck

Class	Description	Age	Weight	Cooking Method
Broiler/fryer	Young bird with tender meat; a soft bill and windpipe	8 weeks or less	3 lb. 8 oz.-4 lb. (1.5-1.8 kg)	Roast at high temperature
Roaster	Young bird with tender meat; rich flavor; easily dented windpipe	16 weeks or less	4-6 lb. (1.8-2.5 kg)	Roast
Mature	Old bird with tough flesh; hard bill and windpipe	6 months or older	4-6 lb. (1.8-2.5 kg)	Braise

The duck used most often in commercial food service operations is a roaster duckling. It contains only dark meat and large amounts of fat. In order to make the fatty skin palatable, it is important to render as much fat as possible. Duck has a high percentage of bone and fat to meat; for example, a 4-pound duck will serve only two people, while a 4-pound roasting chicken will serve four people.

- **duckling** a duck slaughtered before it is eight weeks old
- **magret** a duck breast, traditionally taken from the ducks that produce foie gras; it is usually served boneless but with the skin intact

GEESE

The greylag goose (*Anser anser*) was domesticated by the Egyptians at least 3000 years ago, and a different wild species, the swan goose (*Anser cygnoides*), domesticated in Siberia about a thousand years later, is known as a Chinese goose. The two hybridize with each other and the large knob at the base of the beak, a noticeable feature of the Chinese goose, is present to a varying extent in these hybrids. The hybrids are fertile and have resulted in several of the modern breeds. Despite their early domestication, geese have never gained the commercial importance of chickens and ducks.

Domestic geese are much larger than their wild counterparts are and tend to have thick necks, an upright posture, and large bodies with broad rear ends. The greylag-derived birds are large, fleshy, and used for meat, while the Chinese geese have smaller frames and are mainly used for egg production. The fine down of both is valued for use in pillows and padded garments. They forage on grass and weeds, supplementing this with small invertebrates and one of the attractions of rearing geese is their ability to grow and thrive on a grass-based system.

They are very gregarious with good memories and can be allowed to roam widely in the knowledge that they will return home by dusk. The Chinese goose is more aggressive and noisy than other geese and can be used as a guard animal to warn of intruders. The flesh of meat geese is dark-colored and high in protein, but they deposit fat subcutaneously, although this fat contains mostly monounsaturated fatty acids. The birds are killed either around 10 or about 24 weeks. Between these ages, problems with dressing the carcass occur because of the presence of developing pinfeathers.

In some countries, geese and ducks are force-fed to produce livers with an exceptionally high fat content for the production of foie gras. Over 75% of world production of this product occurs in France, with lesser industries in Hungary and Bulgaria and a growing production in China. Foie gras is considered a luxury in many parts of the world, but the process of feeding the birds in this way is banned in many countries on animal welfare grounds.

A goose contains only dark meat and has very fatty skin. It is usually roasted at high temperatures to render the fat. Roasted goose is popular at holidays and is often served with an acidic fruit-based sauce to offset the fattiness.

United States Department of Agriculture (USDA) Classes of Goose

Class	Description	Age	Weight	Cooking Method	Use
Young	Rich, tender dark meat with large amounts of fat.	6 months	6 - 12 lb.	Roast high temp.	Use in acidic sauces
Mature	Tough flesh and hard windpipe	Over 6 months	10 - 16 lbs.	Braise or stew	Stews

GUINEA

Guinea fowl originated in southern Africa, and the species most often kept as poultry is the helmeted Guinea fowl (*Numida meleagris*). It is a medium-sized grey or speckled bird with a small naked head with colorful wattles and a knob on top, and was domesticated by the time of the ancient Greeks and Romans. Guinea fowl are hardy, sociable birds that subsist mainly on insects, but also consume grasses and seeds. They will keep a vegetable garden clear of pests and will eat the ticks that carry Lyme disease. They happily roost in trees and give a loud vocal warning of the approach of predators. Their flesh and eggs can be eaten in the same way as chickens, young birds being ready for the table at the age of about four months.

A squab is the name given to the young of domestic pigeons that are destined for the table. Like other domesticated pigeons, birds used for this purpose are descended from the rock pigeon (*Columba livia*). Special utility breeds with desirable characteristics are used. Two eggs are laid and incubated for about 17 days. When they hatch, the squabs are fed by both parents on "pigeon's milk", a thick secretion high in protein produced by the crop. Squabs grow rapidly, but are slow to fledge and are ready to leave the nest at 26 to 30 days weighing about 500 g (18 oz.). By this time, the adult pigeons will have laid and be incubating another pair of eggs and a prolific pair should produce two squabs every four weeks during a breeding season lasting several months.

A guinea or guinea fowl is the domesticated descendant of a game bird. It has both light and dark meat and a flavor similar to pheasant. Guinea is tender enough to sauté. Because it contains little fat, a guinea is usually barded prior to roasting. Guinea, which is relatively expensive, is not as popular here as it is in Europe.

TURKEY

Turkeys are large birds, their nearest relatives being the pheasant and the guineafowl. Males are larger than females and have spreading, fan-shaped tails and distinctive, fleshy wattles, called a 'snood' that hang from the top of the beak and are used in courtship display. Wild turkeys can fly, but seldom do so, preferring to run with a long, strutting gait. They roost in trees and forage on the ground, feeding on seeds, nuts, berries, grass, foliage, invertebrates, lizards, and small snakes.

The modern domesticated turkey is descended from one of six subspecies of wild turkey (*Meleagris gallopavo*) found in the present Mexican states of Jalisco, Guerrero and Veracruz. Pre-Aztec tribes in south-central Mexico first domesticated the bird around 800 BC, and Pueblo Indians inhabiting the Colorado Plateau in the United States did likewise around 200 BC. They used the feathers for robes, blankets, and ceremonial purposes. More than 1,000 years later, they became an important food source.[29] The first Europeans to encounter the bird misidentified it as a guineafowl, a bird known as a "turkey fowl" at that time because it had been introduced into Europe via Turkey.

United States Department of Agriculture (USDA) Classes of Turkey

<i>Class</i>	<i>Description</i>	<i>Age</i>	<i>Weight</i>	<i>Cooking Method</i>
Fryer/roaster	Immature bird of either sex; tender meat, smooth skin	16 weeks or less	4-9 lb. 2-4 kg.	Roast, sauté, pan-fry
Young	Tender meat; less-flexible breastbone	8 months or less	8-22 lbs. 3.5-10 kg.	Roast or stew
Yearling	Fully mature bird; reasonably tender or less meat; coarse skin	15 months	10-30 lb. 4.5-13 kg.	Roast or stew
Mature	Older bird; coarse skin; tough flesh or older	15 months or older	10-30 lb. 4.5-13 kg.	Stew; ground processed products

Commercial turkeys are usually reared indoors under controlled conditions. These are often large buildings, purpose-built to provide ventilation and low light intensities (this reduces the birds' activity and thereby increases the rate of weight gain). The lights can be switched on for 24-hrs/day, or a range of stepwise light regimens to encourage the birds to feed often and therefore grow rapidly. Females achieve slaughter weight at about 15 weeks of age and males at about 19. Mature commercial birds may be twice as heavy as their wild counterparts. Many different breeds have been developed, but the majority of commercial birds are white, as this improves the appearance of the dressed carcass, the pin feathers being less visible.[30] Turkeys were at one

time mainly consumed on special occasions such as Christmas (10 million birds in the United Kingdom) or Thanksgiving (60 million birds in the United States). However, they are increasingly becoming part of the everyday diet in many parts of the world.

Turkey is the second most popular category of poultry in the United States. It has both light and dark meat and a relatively small amount of fat. Younger turkey is economical and can be prepared in almost any manner.

QUAIL

The quail is a small to medium-sized, cryptically colored bird. In its natural environment, it is found in bushy places, in rough grassland, among agricultural crops, and in other places with dense cover. It feeds on seeds, insects, and other small invertebrates. Being a largely ground-dwelling, gregarious bird, domestication of the quail was not difficult, although many of its wild instincts are retained in captivity. It was known to the Egyptians long before the arrival of chickens and was depicted in hieroglyphs from 2575 BC. It migrated across Egypt in vast flocks and the birds could sometimes be picked up off the ground by hand.[33] These were the common quail (*Coturnix coturnix*), but modern domesticated flocks are mostly of Japanese quail (*Coturnix japonica*) which was probably domesticated as early as the 11th century AD in Japan. They were originally kept as songbirds, and they are thought to have been regularly used in song contests.

In the early 20th century, Japanese breeders began to selectively breed for increased egg production. By 1940, the quail egg industry was flourishing, but the events of World War II led to the complete loss of quail lines bred for their song type, as well as almost all of those bred for egg production. After the war, the few surviving domesticated quail were used to rebuild the industry and all current commercial and laboratory lines are considered to have originated from this population.

Modern birds can lay upward of 300 eggs a year and countries such as Japan, India, China, Italy, Russia, and the United States have established commercial Japanese quail farming industries. Japanese quail are also used in biomedical research in fields such as genetics, embryology, nutrition, physiology, pathology, and toxicity studies. These quail are closely related to the common quail, and many young hybrid birds are released into the wild each year to replenish dwindling wild populations.

Livers, Gizzards, Hearts, and Necks

Livers, gizzards, hearts and necks are commonly referred to as giblets and can be used in a variety of ways.

Gizzards (a bird's second stomach), hearts and necks are often used to make giblet gravy. Gizzards are sometimes trimmed and deep-fried; hearts are sometimes served sautéed and creamed. Necks are very flavorful and can be added to stocks for flavor and richness. Livers,

hearts and gizzards are not added to stocks, however, because of their strong flavors. Chicken livers are often used in pates, sautéed or broiled with onions and served as an entree.

Foie Gras

Foie gras is the enlarged liver of a duck or goose. Considered a delicacy since Roman times, it is now produced in many parts of the world, including the United States. Foie gras is produced by methodically fattening the birds by force-feeding them specially prepared corn while limiting their activity. Fresh foie gras consists of two lobes that must be separated, split and deveined. Good foie gras will be smooth, round and putty-colored. It should not be yellow or grainy. Goose foie gras is lighter in color and more delicate in flavor than that of duck. Duck foie gras has a deeper, winy flavor and is more frequently used than goose foie gras. Fresh foie gras can be grilled, roasted, sautéed or made into pates or terrines. No matter which cooking method is used, care must be taken not to overcook the liver. Foie gras is so high in fat that overcooking will result in the liver actually melting away. Most foie gras is pasteurized or canned and may consist of solid liver or small pieces of liver compacted to form a block. Canned foie gras mousse is also available, often with truffles, which are a natural accompaniment.

Preparations

Generally, French preparations of foie gras are made over low heat, as fat melts faster from the traditional goose foie gras than the duck foie gras produced in most other parts of the world. American and other New World preparations, typically employing duck foie gras, have more recipes and dish preparations for serving foie gras hot, rather than cool or cold.

In Hungary, goose foie gras traditionally is fried in goose fat, which is then poured over the foie gras and left to cool; it is also eaten warm, after being fried or roasted, with some chefs smoking the foie gras over a cherry wood fire.

In other parts of the world, foie gras is served in dishes such as foie gras sushi rolls, in various forms of pasta or alongside steak tartare or atop a steak as a garnish.

Cold preparations

Traditional low-heat cooking methods result in terrines, pâtés, parfaits, foams and mousses of foie gras, often flavored with truffle, mushrooms or brandy such as cognac or Armagnac. These slow-cooked forms of foie gras are cooled and served at or below room temperature.

In a very traditional form of terrine, *au torchon* ("in a towel"), a whole lobe of foie is molded, wrapped in a towel and slow-cooked in a bain-marie. For added flavor (from the Maillard reaction), the liver may be seared briefly over a fire of grape vine clippings (*sarments*) before slow-cooking in a bain-marie; afterwards, it is pressed served cold, in slices.

Raw foie gras is also cured in salt ("cru au sel"), served slightly chilled.

A pastry containing fatty goose liver and other ingredients is known as the "Strasbourg pie" since Strasbourg was a major producer of foie gras. The pie is mentioned in William Makepeace Thackeray's novel *Vanity Fair* as being popular with the diplomatic corps.

Hot preparations

Given the increased internationalization of cuisines and food supply, foie gras is increasingly found in hot preparations not only in the United States, but also in France and elsewhere. Duck foie gras ("foie gras de canard") has slightly lower fat content and is generally more suitable in texture to cooking at high temperature than is goose foie gras ("foie gras d'oie"), but chefs have been able to cook goose foie gras employing similar techniques developed for duck, albeit with more care.

Raw foie gras can be roasted, sautéed, pan-seared (poêlé) or (with care and attention), grilled. As foie gras has high fat content, contact with heat needs to be brief and therefore at high temperature, lest it burn or melt. Optimal structural integrity for searing requires the foie gras to be cut to a thickness between 15 and 25 mm ($\frac{1}{2}$ – 1 inch), resulting in a rare, uncooked center. Some chefs prefer not to devein the foie gras, as the veins can help preserve the integrity of the fatty liver. It is increasingly common to sear the foie gras on one side only, leaving the other side uncooked. Practitioners of molecular gastronomy such as Heston Blumenthal of The Fat Duck restaurant first flash-freeze foie gras in liquid nitrogen as part of the preparation process.

Hot foie gras requires minimal spices; typically black pepper, paprika (in Hungary) and salt. Chefs have used 'fleur de sel' as a gourmet seasoning for hot foie gras to add an "important textural accent" with its crunch.

Consumption

Foie gras is regarded as a gourmet luxury dish. In France, it is mainly consumed on special occasions, such as Christmas or New Year's Eve *réveillon* dinners, though the recent increased availability of foie gras has made it a less exceptional dish. In some areas of France foie gras is eaten year-round.

Duck foie gras is the slightly cheaper and, since a change of production methods in the 1950s to battery, by far the most common kind, particularly in the US. The taste of duck foie gras is often referred to as musky with a subtle bitterness. Goose foie gras is known for being less gamey and smoother, with a more delicate flavor.

Nutrition

Poultry is an economical source of high-quality protein. Poultry's nutritional values are similar to those of other meats, except that chicken and turkey breast meat is lower in fat and higher in niacin than other lean meats. Generally, dark meat contains more niacin and riboflavin than white meat.

Inspection and Grading of Poultry

Inspection

All poultry produced for public consumption in the United States is subject to USDA inspection. Inspections ensure that products are processed under strict sanitary guidelines and are wholesome and fit for human consumption. Inspections do not indicate a product's quality or tenderness. The round inspection stamp can be found either on a tag attached to the wing or included in the package labeling.



USDA Inspection Stamp for Poultry

GRADING

Grading poultry is voluntary but virtually universal. Birds are graded according to their overall quality, with the grade (USDA A, B or C) shown on a shield-shaped tag affixed to the bird or on a processed product's packaging.



Grade Stamp for USDA Grade A poultry

According to the USDA, Grade A poultry is free from deformities, with thick flesh and a well-developed fat layer; free of pinfeathers, cuts or tears and broken bones; free from discoloration

and , if it is frozen, free from defects that occur during handling or storage. Nearly all poultry used in wholesale and retail outlets is Grade A. Grade B and C birds are used primarily for processed poultry products.

Quality grades have no bearing on the product's tenderness or flavor. A bird's tenderness is usually indicated by its class (for example, a young turkey is younger and tenderer than a yearling). Its grade (USDA A, B or C) within each class is determined by its overall quality.

Purchasing and Storing Poultry

Purchasing Poultry

Poultry can be purchased in many forms: fresh or frozen, whole or cut up, bone - in or boneless, portion controlled (P.C.), individually quick-frozen (IQF) or ground. Chicken and turkey are also widely used in prepared and convenience items and are available fully cooked and vacuum-wrapped or boned and canned. Although purchasing poultry in a ready-to-use form is convenient, it is not always necessary; poultry products are easy to fabricate and portion. Whole fresh poultry is also less expensive than precut or frozen products.

As with meats, you should consider your menu, labor costs, storage facilities and employee skills when deciding whether to purchase whole fresh poultry or some other form.

Storing Poultry

Poultry is a potentially hazardous food. It is highly perishable and particularly susceptible to contamination by salmonella bacteria. It is critical that poultry be stored at the correct temperatures.

Fresh chickens and other small birds can be stored on ice or at 32°F- 34°F (0°C- 2°C) for up to two days; larger birds can be stored up to four days at these temperatures. Frozen poultry should be kept at 0°F (- 18°C) or below (the colder the better) and can be held for up to six months. It should be thawed gradually under refrigeration, allowing two days for chickens and as long as four days for larger birds. Never attempt to cook poultry that is still partially frozen; it will be impossible to cook the product evenly, and the areas that were still frozen may not reach the temperatures necessary to destroy harmful bacteria. Never partially cook poultry one day and finish cooking it later; bacteria are more likely to grow under such conditions.

Sanitation and Cross-Contamination

Review the information on food safety and sanitation, before butchering any poultry. Be sure that all work surfaces, cutting boards, knives, hands and other equipment used to prepare poultry products are clean and sanitary. Be careful that juices and trimmings from poultry are not exposed to other foods. Anything being exposed to raw poultry should be cleaned and sanitized before it is exposed to any other food. Cooked foods should never be placed in containers that

were used to hold the raw product. Kitchen towels that are used to handle poultry or clean up after butchering should be sanitized before being reused to prevent cross-contamination.

Poultry should be rinsed under cold running water, and then dried with clean disposable paper towels before cooking to remove any collected juice.

Butchering Procedures

Poultry is easier to butcher than meats and is often processed on-site. You should be able to perform the following commonly encountered procedures. Because the different kinds of poultry are similar in structure, these procedures apply to a variety of birds.

~Procedure for Cutting a Bird in Half~

Often the first step in preparing poultry is to cut the bird in half. Broiler and fryer chickens are often split to make two portions. This procedure removes the backbone and breastbone (also known as the keel bone) for a neat finished product.

1. Square up the bird by placing it on its back and pressing on the legs and breast to create a more uniform appearance
2. Place the bird on its breast and hold the tail tightly with the thumb and forefinger of one hand. Using a rigid boning knife and in a single swift movement, cut alongside the backbone from the bird's tail to the head.
3. Lay the bird flat on the cutting board and remove the backbone by cutting through the ribs connecting it to the breast.
4. Bend the bird back, breaking the breastbone free.
5. Run your fingers along the bone to separate the breast meat from it; pull the bone completely free. Be sure to remove the flexible cartilage completely.
6. Cut through the skin to separate the bird into two halves. The halves are ready to be cooked; for a more attractive presentation, follow Steps 7 and 8.
7. Trim off the wing tips and the ends of the leg bone.
8. Make a slit in the skin below the leg and tuck the leg bone into the slit.

~Procedure for Cutting a Bird into Pieces~

This is one of the most common butchering procedures. It is also very simple once you understand the bird's structure and are able to find each of its joints.

1. Remove the leg by pulling the leg and thigh away from the breast and cutting through the skin and flesh toward the thigh joint.

2. Cut down to the thigh joint, twist the leg to break the joint and cut the thigh and leg from the carcass. Be careful to trim around the oyster meat (the tender morsel of meat located next to the backbone); leave it attached to the thigh. Repeat with the other leg.
3. To split the breast, follow Steps 2 through 6 for cutting a bird in half. Cut the breast into two halves.
4. The bird is now cut into four quarters.
5. To cut the bird into six pieces, separate the thigh from the leg by making a cut guided by the line of fat on the inside of the thigh and leg.
6. To cut the bird into eight pieces, separate the wing from the breast by cutting the joint, or split the breast, leaving a portion of the breast meat attached to the wing.

~Procedure for Preparing a Boneless Breast~

A boneless chicken breast is one of the most versatile and popular poultry cuts. It can be broiled, grilled, baked, sautéed, pan-fried or poached. Boneless turkey breast can be roasted or sliced and sautéed as a substitute for veal. The skin can be removed, or left intact.

1. Remove the keel bone from the bone-in breast, following Steps 4, 5 and 6 for cutting a bird in half.
2. With the chicken breast lying skin side down, separate the rib bones, wing and wishbone from the breast. Leave the two tender pieces of meat known as the tenderloins attached to the breast. Repeat the procedure on the other side, being sure to remove the small wishbone pieces from the front of the breast.
3. The skin may be left intact or removed to produce a skinless boneless breast.

~Procedure for a Supreme or Airline Breast~

A chicken supreme or airline breast is half of a boneless chicken breast with the first wing bone attached. The tip of the wing bone is removed, yielding a neat and attractive portion that can be prepared by a variety of cooking methods. The skin can be left on or removed.

1. Place the chicken on its back. Remove the legs following Steps 1 and 2 for cutting a bird into pieces. Remove the backbone following Steps 2 and 3 for cutting a bird in half. Remove the keel bone from the bone-in breast, following Steps 4 and 5 for cutting a bird in half.
2. Cut along one side of the breastbone, separating the meat from the bone.
3. Following the natural curvature of the ribs, continue cutting to remove the meat from the bones.

4. When you reach the wing joint, cut through the joint, keeping the wing attached to the breast portion. Cut the breast free from the carcass.
5. Make a cut on the back of the joint between the first and second wing bones.
6. Break the joint and pull the meat and skin back to expose a clean bone. Trim the wing bone.
7. The supreme can be prepared skin-on or skinless.

~Procedure for Boning a Chicken Leg and Thigh~

Chicken breasts are usually more popular than legs and thighs. There are, however, uses for boneless, skinless leg and thigh meat; they can be stuffed or used for Ballantine, for example.

1. Carefully cut through the skin, meat and tendons at the base of the leg. Be sure to cut through completely to the bone.
2. Pull the skin off the leg with your hands, then break the joint between the leg and thigh. Twist and pull out the leg bone.
3. Working from the inside of the thighbone, separate it from the meat.
4. Cut around the cartilage at the joint between the leg and thigh and remove the thighbone and cartilage.

Marinating Poultry

Most poultry is quite mild in flavor, so a marinade is often used to add flavor and moisture, especially to poultry that will be broiled or grilled. Barbecued chicken is a simple and popular example of marinated poultry. Other poultry marinades can be a mixture of white wine or lemon juice, oil, salt, pepper, herbs and spices.

Poultry absorbs flavors quickly, so if pieces are left too long in an acidic marinade, they may take on undesirable flavors. Two hours is often sufficient, with smaller pieces requiring less time in the marinade than larger ones. The acid in the marinade will affect the texture of the protein. Marinating for more than a few hours can overly tenderize meats and poultry. Avoid using excess marinade because it will become contaminated and must be discontinued after using. To help calculate the quantity of marinade to make, figure on using approximately 8 fluid ounces (240 milliliters) of marinade for each double breast of chicken.

If the marinade contains oil, drain the poultry well to avoid flare-up when the item is placed on the broiler or grill. Use a clean kitchen towel or a paper towel to wipe excess moisture from the poultry's surface so that it browns more easily. The marinade can be used to baste the item during cooking, but leftover marinade should not be served uncooked or reused because of the danger of bacterial contamination from the raw poultry.

DRY-HEAT COOKING METHODS

Dry-heat methods are appropriate for young, tender birds. Moist-heat methods should be used with older, less tender products. Cooking poultry with dry-heat methods - broiling and grilling, roasting, sautéing, pan-frying and deep-frying- presents some unique challenges. Large birds such as turkeys benefit from low -heat cooking but are better when served with the crispy skin gained through higher temperatures. Duck and goose skins contain a great deal of fat that must be rendered during the cooking process. Small birds such as squab must be cooked at sufficiently high temperatures to crisp their skins but can be easily overcooked. Boneless chicken breasts, particularly flavorful and popular when broiled or grilled, are easily overcooked and become dry because they do not contain bones to help retain moisture during cooking. Proper application of the following dry-heat cooking methods will help meet these challenges and ensure a good-quality finished product.

BROILING and GRILLING

Broiled and grilled poultry should have a well-browned surface and can show crosshatched grill marks. It should be moist, tender and juicy throughout. It may be seasoned to enhance its natural flavors, marinated, or basted with any number of flavored butters or sauces.

Selecting Poultry to Broil or Grill

Smaller birds such as Cornish hens, chickens and squab are especially well suited for broiling or grilling. Whole birds should be split or cut into smaller pieces before cooking; their joints may be broken so that they lie flat. Quail and other small birds can be skewered before being broiled to help them cook evenly and retain their shape. Be especially careful when cooking breast portions or boneless pieces; the direct heat of the broiler or grill can overcook the item very quickly.

Seasoning Poultry to Be Broiled or Grilled

Poultry is fairly neutral in flavor and responds well to marinating. Poultry may also be basted periodically during the cooking process with flavored butter, oil or barbecue sauce. At the very least, broiled or grilled poultry should be well seasoned with salt and pepper just before cooking.

Determining Doneness

With the exception of duck breasts and squab, which are sometimes left pink, broiled or grilled poultry are always cooked well done. This makes the poultry particularly susceptible to becoming dry and tough because it contains little fat and is cooked at very high temperatures. Particular care must be taken to ensure that the item does not become overcooked.

Four methods used to determine the doneness of broiled or grilled poultry:

1. **Touch** - When the item is done, it will have a firm texture, resist pressure and spring back quickly when pressed with a finger.
2. **Temperature** - Use an instant -read thermometer to determine the item's internal temperature. This may be difficult, however, because of the item's size and the heat from the broiler or grill. Insert the thermometer in the thickest part of the item away from any bones. It should read 165°F- 170°F (74°C-77°C) at the coolest point.
3. **Looseness of the joints** - When bone-in poultry is done, the leg will begin to move freely in its socket.
4. **Color of the juices** - Poultry is done when its juices run clear or show just a trace of pink. This degree of doneness is known in French as 'a point'.

Accompaniments to Broiled and Grilled Poultry

If the item was basted with an herb butter, it can be served with additional butter; if the item was basted with barbecue sauce, it should be served with the same sauce. Be careful, however, that any marinade or sauce that came in contact with the raw poultry is not served unless it is cooked thoroughly to destroy harmful bacteria.

Broiled or grilled poultry is very versatile and goes well with almost any side dish. Seasoned and grilled vegetables are a natural accompaniment, and deep-fried potatoes are commonly served.

~Procedure for Grilling Poultry~

As with meats, broiled or grilled poultry can be prepared by placing it directly on the grate. Poultry is also often broiled using a rotisserie.

1. Heat the broiler or grill.
2. Use a wire brush to remove any charred or burnt particles that may be stuck to the broiler or grill grate. The grate can be wiped with a lightly oiled towel to remove any remaining particles and help season it.
3. Prepare the item to be broiled or grilled by marinating or seasoning as desired; it may be brushed lightly with oil to keep it from sticking to the grate.
4. 10, turn the item to produce the attractive crosshatch marks associated with grilling. Baste the item often. Use tongs to turn or flip the item without piercing the surface so that juices do not escape.
5. Develop the proper surface color while cooking the item until it is done 'a point'. To do so, adjust the position of the item on the broiler or grill, or adjust the distance between

the grate and heat source. Large pieces and bone-in pieces that are difficult to cook completely on the broiler or grill can be finished in the oven.

A commonly used procedure to cook a large volume of poultry is to place the seasoned items in a broiler pan or other shallow pan and then place the pan directly under the broiler. Baste the items periodically, turning them once when they are halfway done. Items begun this way can be easily finished by transfer - ring the entire pan to the oven.

ROASTING

Properly roasted (or baked) poultry is attractively browned on the surface and tender and juicy throughout. Proper cooking temperatures ensure a crisp exterior and juicy interior. Most roasted poultry is cooked until the juices run clear. Squab and duck breasts are exceptions; they are often served medium rare or pink.

Selecting Poultry to Roast

Almost every kind of poultry is suitable for roasting, but younger birds produce the tenderest finished product. Because of variations in fat content, different kinds of poultry require different roasting temperatures and procedures.

Seasoning Poultry to Be Roasted

Although the mild flavor of most poultry is enhanced by a wide variety of herbs and spices, roasted poultry is often only lightly seasoned with salt and pepper. Poultry that is roasted at high temperatures should never be seasoned with herbs on its surface because the high cooking temperatures will burn them. If herbs or additional spices are used, they should be stuffed into the cavity. A mirepoix or a bouquet garni may also be added to the cavity for additional flavor. The cavities of dark-meat birds such as ducks and geese are often stuffed with fresh or dried fruits.

~Procedure for Trussing Poultry~

Trussing is tying a bird into a more compact shape with thread or butcher's twine. Trussing allows the bird to cook more evenly, helps the bird retain moisture and improves the appearance of the finished product. There are many methods for trussing poultry, some of which require a special tool called a trussing needle..

1. Square up the bird by pressing it firmly with both hands. Tuck the first joint of the wing behind the back or trim off the first and second joints as shown.
2. Cut a piece of butcher's twine approximately three times the bird's length. With the breast up and the neck toward you, pass the twine under the bird approximately 1 inch (2.5 centimeters) in front of the tail.

3. Bring the twine up around the legs and cross the ends, creating an X between the legs. Pass the ends of the twine below the legs.
4. Pull the ends of the twine tightly across the leg and thigh joints and across the wings if the first and second joints are trimmed off, or just above the wings if they are intact.
5. Pull the string tight and tie it securely just above the neck.

Barding Poultry to Be Roasted

Guineas, squabs or any skinless birds without an adequate fat covering to protect them from drying out during roasting can be barded. Bard the bird by covering its entire surface with thin slices of fatback, securing them with butcher's twine.

Cooking Temperatures

Roast small birds such as squab and Cornish game hens at the relatively high temperatures of 375°F-400°F (190°C- 200°C). These temperatures help produce crisp, well-colored skins without overcooking the flesh. Roast chickens at temperatures between 350°F and 375°F (180°C and 190°C). This temperature range allows the skin to crisp and the flesh to cook without causing the bird to stew in its own juices. Large birds such as capons and turkeys are started at high temperatures of 400°F-425°F (200°C- 220°C) to brown the skin, then finished at lower temperatures of 275°F- 325°F (35°C- 160°C) to promote even cooking and produce a moister product. Ducks and geese, which are very high in fat, must be roasted at the high temperatures of 375°F-425°F (190°C- 220°C) to render as much fat from the skin as possible. Duck and goose skins are often pricked before roasting so that the rendered fat can escape; this helps create a crispy skin.

Basting Roasted Poultry

With the exception of fatty birds such as ducks and geese, all poultry items should be basted while they roast in order to help retain moisture. To baste a bird, spoon or ladle the fat that collects in the bottom of the roasting pan over the bird at 15-to-20-minute intervals. Lean birds that are not barded will not produce enough fat for basting and may be brushed with butter in the same manner.

Determining Doneness

Four methods are used to determine the doneness of roasted poultry. It is best to use a combination of these methods.

1. **Temperature** - Test the internal temperature of the bird with an instant read thermometer. The thermometer should be inserted in the bird's thigh, which is the last part to become fully cooked. It should not touch the bone and should read 165°F- 170°F (74°C- 77°C) at the coolest point. This method works best with large birds such as capons

and turkeys. Large birds are subject to some degree of carryover cooking. This is not as much of a concern with poultry as it is with meat because large birds are always cooked well done.

- 2. **Looseness of the joints** - The thigh and leg will begin to move freely in their sockets when the bird is done.
- 3. **Color of juices** - This method is used with birds that are not stuffed. Use a kitchen fork to tilt the bird, allowing some of the juices that have collected in the cavity to run out. Clear juices indicate that the bird is done. If the juices are cloudy or pink, the bird is undercooked.
- 4. **Time** - Because there are so many variables, timing alone is less reliable than other methods. It is useful, however, for planning production when large quantities are roasted and as a general guideline when used with other methods.

Accompaniments to Roasted Poultry

The most common accompaniments to roasted poultry are bread stuffing and gravy. Large birds, such as capons and turkeys, produce adequate drippings for making sauce or pan gravy. Small birds, such as squab and Cornish game hens, are often stuffed with wild rice or other ingredients and served with a sauce that is made separately.

Roasting Information

<u>Poultry Kind or Class</u>	<u>Cooking Temperatures</u>		<u>Minutes per lb. (500 g)</u>
Capons	350°F-375°F / 180°C- 190°C		18-20 min.
Chickens	375°F-400°F / 190°C-200°C		15-18 min.
Ducks and geese	375°F-425°F / 190°C-220°C		12-15 min.
Game hens	375°F-400°F / 190°C- 200°C		45-60 min. total
Guineas	375°F-400°F / 190°C-200°C		18-20 min.
Squab	400°F	200°C	30-40 min. total
Turkeys (large)	325°F	160°C	12-15 min.

Ducks and geese are complemented by stuffing containing rice, fruits, berries and nuts. They are very fatty, and if stuffed, they should be roasted on a rack or mirepoix bed to ensure that the fat that collects in the pan during roasting does not penetrate the cavity, making the stuffing greasy. Ducks and geese are often served with a citrus- or fruit-based sauce. Its high acid content complements these rich, fatty birds.

Stuffing Poultry

Safety. Stuffing is a potentially hazardous food. All ingredients used to make stuffing must be cold and stay below 45°F (7°C) when mixing and stuffing into poultry. Stuff a bird as close to cooking time as possible to keep it out of the temperature danger zone. Observe proper cooking temperatures and roast until the bird reaches an internal temperature of 165°F (74°C) as indicated by an instant-read thermometer placed deep into the stuffing. Remove all stuffing from the bird's cavity promptly. If left in the cavity, stuffing will not cool and will become a potential breeding ground for bacteria.

~Procedure for Stuffing Poultry~

Small birds such as Cornish game hens, small chickens and squab can be stuffed successfully. Stuffing larger birds, especially for volume production, is impractical and can be dangerous for the following reasons:

1. Stuffing is a good bacterial breeding ground, and because it is difficult to control temperatures inside a stuffed bird, there is a risk of food-borne illness.
2. Stuffing poultry is labor intensive.
3. Stuffed poultry must be cooked longer to cook the stuffing properly; this may cause the meat to be overcooked, becoming dry and tough.

When stuffing any bird, use the following guidelines:

1. Always be aware of temperatures when mixing the raw ingredients. All ingredients should be cold when mixing, and the mixture's temperature should never be allowed to rise above 45°F (7°C).
2. Stuff the raw bird as close to roasting time as possible.
3. Stuff the neck and main body cavities loosely. The stuffing will expand during cooking.
4. After filling the cavities, their openings should be secured with skewers and butcher's twine or by trussing.
5. After cooking, remove the stuffing from the bird and store separately.

~Procedure for Roasting Poultry~

1. Season, bard, stuff and/or truss the bird as desired.

2. Place the bird in a roasting pan. It may be placed on a rack or a bed of mirepoix in order to prevent scorching and promote even cooking.
3. Roast uncovered, basting every 15 minutes.
4. Allow the bird to rest before carving to allow even distribution of juices. As the bird rests, prepare the pan gravy or sauce.

Carving Roasted Poultry

Poultry can be carved in the kitchen, at tableside, or on a buffet in a variety of manners. The carving methods described next produce slices of both light and dark meat.

~Procedure for Carving a Turkey or Other Large Bird~

1. After roasting, allow the turkey to stand for 20 minutes so that the juices can redistribute themselves. Holding the turkey firmly with a carving fork, pry a leg outward and locate the joint. Remove the leg and thigh in one piece by cutting through the joint with the tip of a knife.
2. Repeat the procedure on the other side. Once both legs and thighs have been removed, slice the meat from the thigh by holding the leg firmly with one hand and slicing parallel to the bone.
3. Separate the thigh from the leg bone by cutting through the joint. Slice the meat from the leg by cutting parallel to the bone.
4. Cut along the backbone, following the natural curvature of the bones separating the breast meat from the ribs.
5. Remove an entire half breast and slice it on the cutting board as shown. Cut on an angle to produce larger slices.
6. Alternatively, the breast can be carved on the bird. Make a horizontal cut just above the wing in toward the rib bones.

~Procedure for Carving a chicken or Other Small Bird~

1. After allowing the roasted chicken to rest for 15 minutes so that the juices can redistribute themselves, cut through the skin between the leg and breast.
2. Use a kitchen fork to pry the leg and thigh away from the breast. Locate the thigh's ball joint and cut through it with the knife tip, separating it completely from the rest of the chicken. Be sure to cut around the delicate oyster meat, leaving it attached to the thigh.
3. With the knife tip, cut through the skin and meat on one side of the breast bone. Cut and pull the meat away from the bones with the knife.

4. Cut through the wing joint, separating the breast meat and wing from the carcass. Repeat this procedure on the other side of the bird.
5. The chicken is now quartered.
6. To cut it into eight pieces, separate the wings from the breasts and the thighs from the legs.

POELEING

Poeleing is a cooking method similar to both roasting and braising. The item is cooked in the oven in a covered pot so that it cooks in its own juices and steam. Although this is a moist-heat cooking technique (because the item steams in its own juices), it is used only for tender cuts, not those that need long, slow braising. The cooking time is usually shorter than that needed for dry roasting.

The item to be poelected can first be browned in hot fat and then laid on a bed of ****matignon**, covered and cooked in the oven. If the item was not browned in hot fat first, it can later be browned by removing the lid toward the end of cooking. Doneness is determined using the same techniques as those used for roasting.

Vegetables intended for service with the dish can be added to the poele as it cooks, or cooked separately and plated with the finished item. The sauce for a poele is made from the flavorful cooking juices left in the pan. They are mixed with a liquid (stock, jus lie or demi-glace) and finished using the same techniques as those for a braised dish. The matignon can be left in the finished sauce or strained.

****Matignon** is a combination of minced vegetables, usually onion (and/or leek), celery, and carrot, with thyme and bay leaf, sautéed in butter over a low flame until softened and translucent ("melted" but not browned), seasoned to taste with a pinch of salt (and a pinch of sugar, if needed), and finished with a dash of white wine or Madeira.

~Procedure for Poeleing Poultry~

1. Sear the main item in hot butter or oil, if desired.
2. Place the main item on a bed of matignon. Add vegetables or other ingredients as called for in the recipe.
3. Cover and cook in the oven until done. Baste periodically with pan juices or with additional butter.
4. If the main item was not first browned in hot fat, it can be browned by removing the lid toward the end of the cooking period, if desired.
5. Remove the main item when done.

6. To make a sauce, add a liquid to the matignon and cooking juices in the pan and reduce. Remove the matignon if desired and add flavorings as directed in the recipe.

SAUTEING

Sautéed poultry should be tender and juicy, its flavor developed by proper browning. Additional flavors come from a sauce made by deglazing the pan, usually with wine, and adding garnishes, seasonings and liquids. Stir-frying is a popular method of sautéing poultry; boneless pieces are cut into strips and quickly cooked with assorted vegetables and seasonings.

Selecting Poultry to Sauté

Most poultry is quite tender and well suited for sautéing. Although small birds such as squab can be sautéed bone-in, large pieces and bone-in cuts from large r birds should not be sautéed. Boneless breasts, supremes, scallops and cutlets are the most common and practical cuts for sautéing. Because they are high in fat, boneless duck breasts can be sautéed without additional fat.

Seasoning Poultry to Be Sautéed

Poultry has a delicate flavor that is enhanced by a wide variety of herbs, spices, condiments and marinades. Flavor combinations are limited only by your imagination. When poultry items are dusted with flour before sautéing, the seasonings may first be added to the flour.

Cooking Temperatures

The sauté pan and the cooking fat must be hot before adding the poultry. Determine the temperature at which the poultry is then sautéed by its thickness and the desired color of the finished product. A thin, boneless slice requires relatively high temperatures so that its surface is browned before the center is over- cooked. A thicker cut such as a supreme requires lower temperatures so that neither its surface nor the fond are burned before the item is fully cooked.

Adjust the temperature throughout the cooking process in order to achieve the desired results, never letting the pan become too cool. If the pan is overcrowded or otherwise allowed to cool, the poultry will cook in its own juices and absorb oil from the pan, resulting in a poor-quality product.

Determining Doneness

Thin cuts of poultry cook very quickly, so timing is a useful tool; it is less useful with thicker cuts. Experienced cooks can tell the doneness of an item by judging the temperature of the sauté pan and the color of the item being cooked.

A more practical method is to press the item with your finger and judge the resistance. Very undercooked poultry will offer little resistance and feel mushy. Slightly underdone poultry will

feel spongy and will not spring back when your finger is removed. Properly cooked poultry will feel firm to the touch and will spring back when your finger is removed. Overcooked poultry will feel very firm, almost hard, and will spring back quickly when your finger is removed.

Accompaniments to Sautéed Poultry

Sautéed poultry is usually served with a sauce made directly in the pan in which the item was cooked. The sauce uses the fond for added flavor. A wide variety of ingredients, including garlic, onions, shallots, mushrooms and tomatoes, are commonly added to the pan as well as wine and stock. Sautéed items are often served with a starch such as pasta, rice or potatoes.

~Procedure for Sautéing Poultry~

Heat a sauté pan and add enough fat or oil to just cover the bottom.

1. Add the poultry item, presentation side down, and cook until browned.
2. Turn the item, using tongs or by tossing the item back on itself using the pan's sloped sides.
3. Larger items can be finished in an oven. Either place the sauté pan in the oven or transfer the poultry to another pan. The latter procedure allows a sauce to be made in the original pan while the poultry cooks in the oven. Hold smaller pieces that are thoroughly cooked in a warm place so that the pan can be used for making the sauce.

~Procedure for Preparing a Sauce in a Saucepan~

1. Pour off any excess fat or oil from the sauté pan, leaving enough to sauté the sauce ingredients.
2. Add ingredients such as garlic, shallots and mushrooms that will be used as garnishes and sauce flavorings; sauté them.
3. Deglaze the pan with wine, stock or other liquids. Scrape the pan, loosening the fond and allowing it to dissolve in the liquid. Reduce the liquid.

PAN-FRYING

Pan-fried poultry should be juicy. Its coating or batter should be crispy, golden brown, not excessively oily and free from any breaks that allow fat to penetrate. Both the poultry and the coating should be well seasoned.

Selecting Poultry to Pan-Fry

The most common pan-fried poultry is fried chicken. Young tender birds cut into small pieces produce the best results. Other cuts commonly pan-fried are bone- less portions such as chicken breasts and turkey scallops.

Seasoning Poultry to Be Pan-Fried

Pan -fried poultry is usually floured, breaded or battered before cooking. Typically, the seasonings are added to the flour, breading or batter before the poultry is coated. Seasonings can be a blend of any number of dried herbs and spices. Often only salt and pepper are required because the poultry will be served with a sauce or other accompaniments for additional flavors.

Cooking Temperatures

The fat should always be hot before the poultry is added. The temperature at which it is cooked is determined by the length of time required to cook it thoroughly. Pan -frying generally requires slightly lower temperatures than those used for sautéing. Within this range, thinner items require higher temperatures to produce good color in a relatively short time. Thicker items and those containing bones require lower cooking temperatures and longer cooking times.

Determining Doneness

Even the largest pan-fried items may be too small to be accurately tested with an instant -read thermometer, and using the touch method can be difficult and dangerous because of the amount of fat used in pan-frying. Timing and experience are the best tools to determine doneness. Thin scallops cook very quickly, so it is relatively easy to judge their doneness. On the other hand, fried chicken can take as long as 30-45 minutes to cook, requiring skill and experience to determine doneness.

Accompaniments to Pan-Fried Poultry

Because pan-frying does not produce fond or drippings that can be used to make a sauce, pan-fried poultry is usually served with lemon wedges, a vegetable garnish or a separately made sauce. Fried chicken is an exception; it is sometimes served with a country gravy made by degreasing the pan, making a roux with a portion of the fat and adding milk and seasonings.

~Procedure for Pan-Frying Poultry~

1. Heat enough fat in a heavy sauté pan to cover the item to be cooked one-fourth to halfway up its side. The fat should be at approximately 325°F (160°C).
2. Add the floured, breaded or battered item to the hot fat, being careful not to splash. The fat must be hot enough to sizzle and bubble when the item is added.
3. Turn the item when the first side is the proper color; it should be half cooked at this point. Larger items may need to be turned more than once to brown them properly on all sides.

4. Remove the browned poultry from the pan and drain it on absorbent paper.
5. Add any ingredients that do not require long cooking times such as herbs and spices. Adjust the sauce's consistency and seasonings.
6. For service, the poultry can be returned to the pan for a moment to reheat it and to coat it with the sauce. The poultry should remain in the sauce just long enough to reheat. Do not attempt to cook the poultry in the sauce.
7. Serve the poultry with accompanying sauce.

DEEP-FRYING

Young, tender poultry is an excellent and popular choice for deep-frying. The pieces should be golden brown on the outside, moist, and tender on the inside. They should be neither greasy nor tough. Chopped cooked poultry can also be mixed with a heavy béchamel or veloute sauce and seasonings, breaded, and deep-fried as croquettes.

Selecting and Seasoning Poultry to Be Deep-Fried

Portioned chickens and whole small birds, such as Rock Cornish game hen, are best for deep-frying. Although they can be marinated or seasoned directly, it is more common to season the batter or breading that will coat them. Additional flavors come from the sauces and accompaniments served with the deep-fried poultry. Lemon wedges, sweet and sour sauce or tangy barbecue sauces are popular accompaniments to deep-fried poultry.

~Procedure for Deep-frying Poultry~

1. Cut, trim or otherwise prepare the poultry to be deep-fried. Season and bread or batter it, as desired.
2. Heat the fat to the desired temperature, usually around 350°F (177°C).
3. Breaded or battered poultry cooks quickly and the fat must be hot enough to cook the food's interior without burning its surface.
4. Carefully place the poultry in the hot fat using the basket method.
5. Deep-fry the food until done. It should have a crispy, golden brown surface.
6. Remove the deep-fried poultry from the fat and hold it over the fat, allowing the excess fat to drain. Transfer the food to a hotel pan either lined with absorbent paper or fitted with a rack. Season with salt, if desired.
7. If the deep-fried poultry is to be held for later service, a heat lamp is effective to maintain temperature.

MOIST-HEAT COOKING METHODS

The moist-heat cooking methods most often used with poultry are poaching and simmering. Poaching is used to cook tender birds for short periods. Simmering is used to cook older, tougher birds for longer periods in order to tenderize them. Poaching and simmering are similar procedures, the principal differences being the temperature of the cooking liquid and the length of cooking time.

POACHING and SIMMERING

Poached or simmered poultry should be moist, tender and delicately flavored. Although the poultry is cooked in water, overcooking will cause it to become dry and tough. During cooking, some of the poultry's flavor is transferred to the cooking liquid, which can be used to make a sauce for the finished product.

Selecting Poultry to Poach or Simmer

Young birds are best suited for poaching; boneless chicken pieces are the most commonly used parts. Older, tougher birds are usually simmered. Duck and geese are rarely poached or simmered because of their high fat content.

Seasoning Poultry to Be Poached or Simmered

When poaching poultry, it is especially important to use a well-seasoned and highly flavored liquid during the cooking process in order to infuse as much flavor as possible. Either strong stock with a sachet or a mixture of stock or water and white wine with a bouquet garni or onion piquet produces good results. Completely cover the poultry with liquid so that it cooks evenly. However, if too much liquid is used and it is not strongly flavored, flavors may be leached out of the poultry, resulting in a bland finished product.

Poultry is often simmered in water instead of stock. A sachet and a generous mirepoix should be added to help flavor it. Typically, simmering birds' results in a strong broth used to complete the recipe, or reserved for other uses.

Cooking Temperatures

For best results, poultry should be poached at low temperatures, between 160°F and 175°F (71°C and 79°C). Cooking poultry to the proper doneness at these temperatures produces a product that is moist and tender.

Simmering is done at slightly higher temperatures, between 185°F (85°C) and the boiling point. When simmering, do not allow the liquid to boil, as this may result in a dry, tough and stringy finished product.

Determining Doneness

Poached poultry, whether whole or boneless, is cooked just until done. An instant -read thermometer inserted in the thigh or thicker part of the bird should read 165°F (74°C). Any juices that run from the bird should be clear or show only a trace of pink.

Simmered poultry is usually cooks for longer periods to allow the moist heat to tenderize the meat. A chicken that weighs 3 pounds 8 ounces (1.5 kilograms), for example, may take 21 hours to cook.

Accompaniments to Poached or Simmered Poultry

Poached or simmered poultry can be served hot or cold. The meat from these birds can be served cold in salads, served hot in casseroles or used in any dish that calls for cooked poultry.

Poached items are typically served with a flavored mayonnaise or a sauce made from the reduced poaching liquid, such as sauce supreme. Poultry is also often poached as a means of producing a low-calorie dish. If so, a vegetable coulis makes a good sauce, or the poultry can be served with a portion of its cooking liquid and a vegetable garnish.

Simmered poultry to be served cold will be moister and more flavorful if it is cooled in its cooking liquid. To do so, remove the pot containing the bird and the cooking liquid from the heat when the bird is still slightly undercooked. Cool the meat and broth in a water bath following the procedure in Chapter 11, Stocks and Sauce s. Once cooled, remove the meat and wipe off any congealed broth before proceeding with the recipe.

~Procedure for Poaching or simmering Poultry~

1. Cut or truss the item to be cooked as directed in the recipe.
2. Prepare the cooking liquid and bring it to a simmer. Submerge the poultry in the cooking liquid, or arrange the items to be poached in an appropriate pan and add the poaching liquid to the pan.
3. Poach or simmer the item to the desired doneness in the oven or on the stovetop. Maintain the proper cooking temperature throughout the process.
4. Remove the poultry and hold it for service in a portion of the cooking liquid or, using an ice bath, cool the item in its cooking liquid.

5. The cooking liquid may be used to prepare an accompanying sauce or reserved for use in other dishes.

COMBINATION COOKING METHODS

Braising and stewing use both dry and moist heat to produce a moist, flavorful product. The principal difference between braising and stewing when applied to meats is the size of the cut being cooked: Large cuts of meat are braised; smaller ones are stewed. Because most poultry is relatively small, this distinction does not readily apply in poultry cookery; therefore, the two cooking methods are discussed together here.

BRAISING and STEWING

Braised or stewed poultry should be moist and fork tender. The poultry is always served with the liquid in which it was cooked. Ducks and geese are braised or stewed in much the same way as red meats. Chicken cacciatore, coq au vin and chicken fricassee are examples of braised or stewed chicken dishes.

Selecting Poultry to Braise or Stew

Braising and stewing, being slow, moist cooking processes, are often thought of as a means to tenderize tough meats. Although they can be used to tenderize older, tougher birds, these cooking methods are more often selected as a means of adding moisture and flavor to poultry that is inherently tender, such as young ducks and chickens. Typically, the birds are disjointed and cooked bone-in, just until done, so that they retain their juiciness.

Seasoning Poultry to Be Braised or Stewed

Braised or stewed items obtain much of their flavor from the cooking liquid and other ingredients added during the cooking process. The main item and the cooking liquid should be well seasoned. If other seasonings such as an onion piquet, sachet, bouquet garni or dried herbs and spices are required, they should be added at the beginning of the cooking process rather than at the end. This allows the flavors to blend and penetrate the larger pieces of poultry. If the poultry is dredged in flour prior to browning, seasonings may be added directly to the flour. As with all dishes using combination-cooking methods, the finished dish should have the flavor of the poultry in the sauce and the moisture and flavor of the sauce in the poultry.

Cooking Temperatures

Some recipes, such as chicken cacciatore and coq au vin, require the main item to be thoroughly browned during the initial stages; others, such as chicken fricassee, do not. In either case, after the liquid is added, it is important to maintain a slow simmer rather than a rapid boil. This can be done on the stovetop or in the oven. Low temperatures control the cooking and produce a tender, juicy finished product.

Determining Doneness

Tenderness is the key to determining doneness. It can be determined by inserting a kitchen fork into the poultry. There should be little resistance, and the poultry should freely fall off the fork. The pieces should retain their shape, however; if they fall apart, they are overdone. Small boneless pieces can be tested by cutting into them with a fork.

Accompaniments to Braised or Stewed Poultry

All braises and stews are cooked in a liquid that results in a sauce or broth served as part of the finished dish. Rice, pasta or boiled potatoes are natural accompaniments to almost any braised or stewed dish, as are boiled vegetables.

~Procedure for Braising or Stewing Poultry~

1. Sear the main item in butter or oil, developing color as desired.
2. Add vegetables and other ingredients as called for in the recipe and sauté.
3. Add flour or roux if used.
4. Add the appropriate liquid.
5. Cover and simmer on the stovetop or in the oven until done.
6. Add seasonings and garnishes at the appropriate times during the cooking process.
7. Finish the dish by adding cream or a liaison to the sauce or by adjusting its consistency. Adjust the seasonings.
8. Serve a portion of the poultry with the sauce and appropriate garnish.

Notes:

Video Sources for Poultry Fabrication:

<https://moodle.nicholls.edu/mod/url/view.php?id=695623>

<https://moodle.nicholls.edu/mod/url/view.php?id=695626>

Topic Three

Laboratory Production of Duck, Ostrich

In Lab today you will learn to fabricate whole duck and carve roasted Ostrich. Rely on the chef demonstrations for these fabrication methods.

Recipes for today include:

Duck Confit

Spiced Ostrich Tenderloin

Lavender and Spice Crusted Duck Breast

Topic Four:
Fin Fish, Flat Fish and Round Fish



FISH

Fish are aquatic vertebrates with fins for swimming and gills for breathing. Of the more than 30,000 species known, most live in the seas and oceans; freshwater species are far less numerous. Shellfish are aquatic invertebrates with shells or carapaces. They are found in both fresh and salt water.

Always an important food source, fish and shellfish have become increasingly popular in recent years, due in part to demands from health-conscious consumers. Because of increased demand and improved preservation and transportation techniques, good-quality fish and shellfish, once found only along seacoasts and lakes, are now readily available to almost every food service operation.

Many fish and shellfish species are very expensive; all are highly perishable. Because their cooking times are generally shorter and their flavors more delicate than meat or poultry, special attention must be given to fish and shellfish to prevent spoilage and to produce high-quality finished products.

STRUCTURE and MUSCLE COMPOSITION

The fish and shellfish used in food service operations can be divided into three categories: fish, mollusks and crustaceans.

Fish include both fresh and saltwater varieties. They have fins and an internal skeleton of bone and cartilage. Based on shape and skeletal structure, fish divide into two groups: round fish and flatfish. **Round fish** swim in a vertical position and have eyes on both sides of their heads. Their bodies may be truly round, oval or compressed.

Flatfish have asymmetrical, compressed bodies, swim in a horizontal position and have both eyes on top of their heads. Flatfish are bottom dwellers; most are found in deep ocean waters around the world. The skin on top of their bodies is dark, to camouflage them from predators, and can change color according to their surroundings. Their scales are small, and their dorsal and anal fins run the length of their bodies.

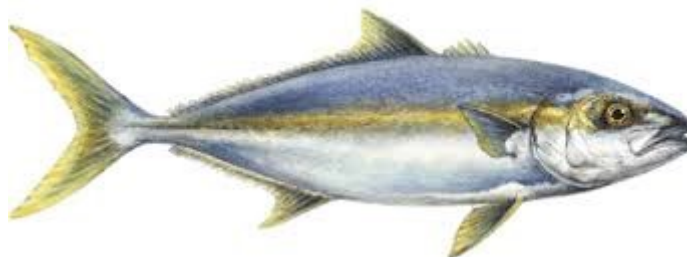
The flesh of fish and shellfish consists primarily of water, protein, fat and minerals. Fish flesh is composed of short muscle fibers separated by delicate sheets of connective tissue. Fish, as well as most shellfish, are naturally tender, so the purpose of cooking is to firm proteins and enhance flavor. The absence of the oxygen-carrying protein myoglobin makes fish flesh very light or white in color. (The orange color of salmon and some trout comes from pigments found in their food.) Compared to meats, fish do not contain large amounts of intermuscular fat. However, the amount of fat a fish does contain affects the way it responds to cooking. Fish containing a relatively large amount of fat, such as salmon and mackerel, are known as fatty or oily fish. Fish such as cod and haddock contain very little fat and are referred to as lean fish. Shellfish are also very lean.

IDENTIFYING FISH

Identifying fish and shellfish properly can be difficult because of the vast number of similar-appearing fish and shellfish that are separate species within each family. Adding confusion are the various colloquial names given to the same fish or the same name given to different fish in different localities. Fish with an unappealing name may also be given a catchier name or the name of a similar but more popular item for marketing purposes. Moreover, some species are referred to by a foreign name, especially on menus.

The FDA publishes a list of approved market names for food fish in *The Seafood List: FDA Guide to Acceptable Market Names for Food Fish Sold in Inter- state Commerce 2002*. The list is updated regularly and available on the FDA's Web site at the Center for Food Safety and Applied Nutrition. Deviations from this list are strongly discouraged but difficult to enforce. We attempt to use the most common names for each item, whether they are zoologically accurate or not.

Round Fish



Amberjack

Amberjack are predators. They feed on pelagic and benthic fish. Their prey also includes squid and crustaceans, as well as sardines and bigeye scad. Younger juvenile jacks tend to feed on plankton and small invertebrates. Greater Amberjacks mature at around 4 years old, and migrate in late spring to early summer (March to June) to reproduce. They migrate to deeper water to spawn, producing their young near shipwrecks or large objects as a safe haven. Females are much larger than males, and have a higher life expectancy. The maximum lifespan for females is 17 years, whilst the average is 10 due to popular demand for them in big game fishing and as a high-quality food fish. Amberjacks are not top of the food chain in their habitat, and therefore are prone to being prey for Yellowfin Tuna, sharks and other larger fish.

Bass commonly refers to a number of unrelated spiny-finned fish. The better-known freshwater bass varieties (largemouth, smallmouth, redeye and black) are actually members of the sunfish family. They are lean and delicate but, as game, not commercially available in the United States. The saltwater bass varieties (black sea bass and striped bass) are popular commercial items.



Black sea bass

Black sea bass are sometimes referred to as rock sea bass. They have a lean, firm white flesh with a mild flavor and flaky texture. They usually weigh from 1 1/2 to 3 pounds (720 to 1360 grams) and are most prevalent in the Atlantic Ocean between New York and North Carolina. Black sea bass can be prepared by almost any cooking method and are often served whole in Chinese and Italian cuisines.



Striped bass

Striped bass, often erroneously referred to as rockfish, are **anadromous**. True striped bass cannot be marketed because pollution and overfishing have damaged the supply. A hybrid of striped bass and either white bass or white perch is **aqua farmed** for commercial use, however. It is this hybrid that food service operations receive as striped bass. Whole fish weigh from 1 to 5 pounds (450 grams to 2.2 kilograms). Striped bass have a rich, sweet flavor and firm texture. They can be steamed, baked, poached or broiled.



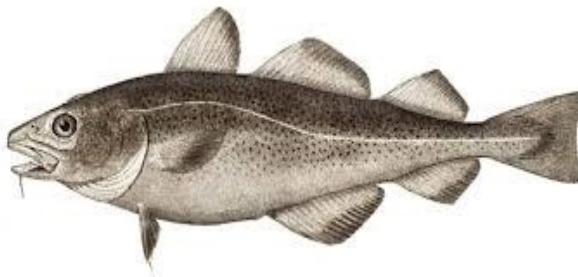
Channel catfish



Catfish fillet

Catfish are scaleless freshwater fish common in southern lakes and rivers and now aqua farmed extensively. Aquafarm raising eliminates the "muddy" flavor once associated with catfish and ensures a year -round supply. The flesh is pure white with a moderate fat content; a mild, sweet flavor; and a firm texture. Channel catfish are the most important commercially. They usually weigh from 1½ to 5 pounds (720 grams to 2.2 kilograms). The smaller of these fish are known as **fiddlers**; they are often deep-fried and served whole. Catfish may be prepared by almost any cooking method, but are especially well suited to frying. Note that other species are often imported to the United States under the generic name *catfish*. Only products labeled "U.S. Farm-Raised Catfish" provide the consistent high quality and flavor that consumers have come to expect, however.

The cod family includes Atlantic and Pacific cod as well as Pollock, haddock, whiting and hake. Cod have a mild, delicate flavor and lean, firm white flesh that flakes apart easily. Cod can be prepared by most cooking methods, although grilling is not recommended because the flesh is too flaky.

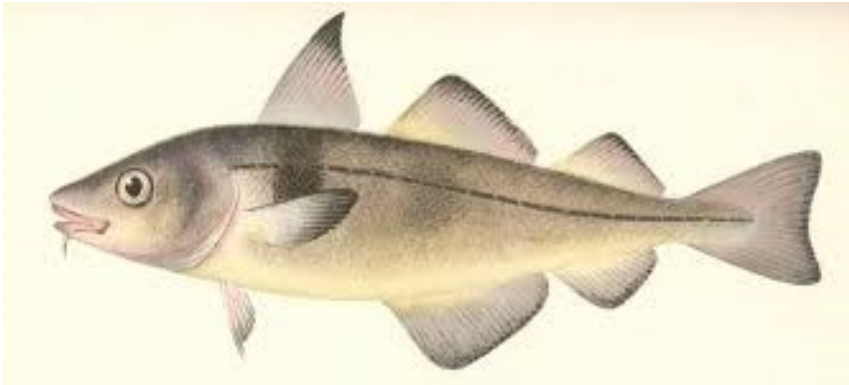


Atlantic Cod



Cod fillet

Atlantic cod are the best-selling fish in America. They are available fresh, whole or drawn, or cut into fillets or steaks. They are also available frozen and are often used for precooked or pre-breaded sticks or portions. Smoked cod and dried salt cod are also available. Although cod may reach 200 pounds (90 kilograms), most market cod weigh 10 pounds (4.4 kilograms) or less. **Scrod** is a marketing term for cod or haddock weighing less than 2 pounds (1.1 kilograms) or less than 20 inches (50 centimeters) in length.



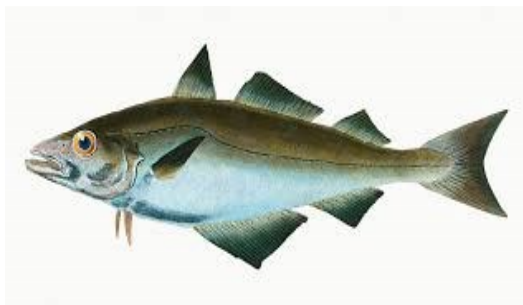
Haddock

Haddock, the second most commercially important fish, look like thin, small Atlantic cod and weigh about 2 to 5 pounds (900 grams to 2.3 kilograms). They have a stronger flavor and more delicate texture than Atlantic cod.



Pacific cod

Pacific cod, also known as gray cod, are found in the northern Pacific Ocean and are not as abundant as their Atlantic cousins are. Pacific cod are most often available frozen; they should be labeled "true cod" to distinguish them from rock cod and black cod, which are unrelated.



Pollock



Pollock fillet

Pollock, also known as Boston bluefish or blue cod, are plentiful in the northern Atlantic and Pacific Oceans. Their flesh is gray-pink when raw, turning white when cooked. Pollock are often frozen at sea, then reprocessed into surimi. They can also be salted or smoked.



Fresh water eels

Eels are long, snakelike freshwater fish with dorsal and anal fins running the length of their bodies. (The conger eel is from a different family and has little culinary significance.) American and European eels are available live, whole, gutted or as fillets. Eels have a high fat content and firm flesh; they are sweet and mildly flavored. Their tough skin should be removed before cooking. Eels may be steamed, baked, fried or used in stews. Baby eels are a springtime delicacy, especially in Spain, where they are pan-fried in olive oil and garlic with hot red peppers. Smoked eels are also available.

The **grouper** family includes almost four hundred varieties found in temperate waters worldwide. The more common Atlantic Ocean varieties are the yellowfin grouper, black grouper, red grouper and gag; the Pacific



Sea bass

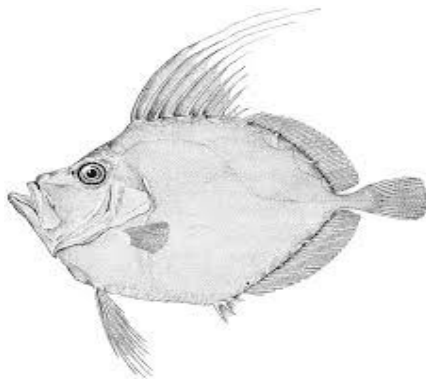
Ocean varieties are the **sea bass** (also known as jewfish and different from the black sea bass) and spotted cabrilla. Although some species can reach 800 pounds or more, most commercial varieties are sold in the 5-to 20-pound (2.2-to 8.8-kilogram) range. They have lean white flesh with a mild to sweet flavor and very firm texture. Their skin, which is tough and strongly flavored, is generally removed before cooking. Grouper fillets may be baked, deep-fried, broiled or grilled.



Herring

Herring are long, silvery-blue fish found in both the northern Atlantic and Pacific Oceans. Their strongly flavored flesh has a moderate to high fat content. Whole herring weigh up to 8 ounces (225 grams). Fresh herring may be butterflied or filleted and roasted, broiled or grilled. But because herring are very soft and tend to spoil quickly, they are rarely available fresh. More often, they are smoked (and known as kippers) or cured in brine.

Very young, small herring are known as **sardines**. They have fatty, oily flesh with a flaky texture. Sardines are usually sold canned, whole or as skinned and boned fillets, or fried or smoked and packed in oil or sauce. Sardines are used primarily for sandwiches and salads.



John Dory



John Dory at fish market

John Dory, also known as St. Peter's fish, have a distinctive round, black spot with a yellow halo on each side of the body. Their flesh is white, firm and finely flaked. They may be filleted and prepared like flounder and are a classic bouillabaisse ingredient.

SURIMI

Surimi is made from a highly processed fish paste colored, flavored and shaped to resemble shrimp, lobster, crab or other shellfish. Most surimi is based on Alaskan Pollock, but some blends include varying amounts of real crab, shrimp or other items. Available chilled or frozen, surimi is already fully cooked and ready to add to salads, pasta, sauces or other dishes. Surimi is very low in fat and relatively high in protein. Because of processing techniques, however, it has more sodium and fewer vitamins and minerals than the real fish or shellfish it replaces. Americans now consume more than 100 million pounds of surimi each year, and its popularity continues to grow. The FDA requires that all surimi products be labeled "imitation."

Mackerel of culinary importance include king and Spanish mackerel as well as tuna and wahoo, which are discussed separately later.



Mackerel



Mackerel at fish market



King mackerel



Mahi Mahi



Spanish mackerel

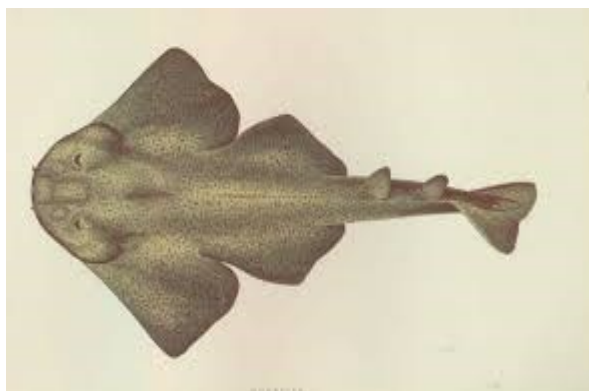


Bigeye tuna



Wahoo

The species known as Atlantic and Pacific mackerel are not generally used for food because of their small size and high fat content. Mackerel flesh has a high fat content, gray to pink coloring, a mild flavor and flaky texture. The flesh becomes firm and off-white when cooked. Mackerel are best broiled, grilled, smoked or baked. Mahi-mahi is the more commonly used name for dolphin or dolphinfish; this Hawaiian name is used to distinguish them from the marine mammal of the same name. (Dolphins and porpoises are marine mammals.) Also known by their Spanish name, Dorado, mahi-mahi are brilliantly colored fish found in tropical seas. Mahi-mahi weigh about 15 pounds (6.6 kilograms) and are sold whole or as fillets. Their flesh is off-white to pink, lean and firm with a sweet flavor. Dolphinfish can be broiled, grilled or baked. The meat may become dry when cooked, however, so a sauce or marinade is recommended.

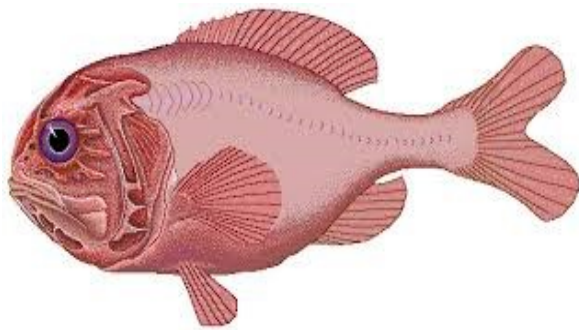


Monkfish



Monkfish at market

Monkfish are also known as anglerfish, goosefish, rape, and lotte. These extraordinarily ugly fish are rarely seen whole, for the large head is usually discarded before reaching market. Only the tail is edible; it is available in fillets, fresh or frozen. The scaleless skin must be removed. The flesh is lean, pearly white and very firm. Its texture and flavor have earned monkfish the nickname of "poor man's lobster." Monkfish absorb flavors easily and are baked, steamed, fried, grilled or broiled. They are also used for stews and soups.



Orange roughy

Orange roughy are caught in the South Pacific off the coasts of New Zealand and Australia. They have bright orange skin and firm, pea rly-white flesh with a low fat content and extremely bland flavor. Orange roughy are usually marketed as skinless, boneless frozen fillets, averaging 6 to 8 ounces (140 to 225 grams) each. Widely available year-round, they can be broiled, steamed, grilled or prepared in the same manner as cod.



Red snapper

Red snapper is also known as the American or northern red snapper. Although there are many members of the snapper family, only one is the true red snapper. Red -skinned rockfish are often mislabeled as the more popular red snapper or Pacific snapper, a practice that is currently legal only in California. True red snapper have lean, pink flesh that becomes white when cooked; it is sweet-flavored and flaky. They are sold whole or as fillets with the skin left on for identification. Red snapper may reach 35 pounds, but most are marketed at only 4 to 6 pounds (1.8 to 2.7 kilograms) or as 1- to 3-pound (450-gram to 1.3-kilogram) fillets. Red snapper can be prepared using almost any cooking method. The head and bones are excellent for stock.

Salmon flourish in both the northern Atlantic and Pacific Oceans, returning to the freshwater rivers and streams of their birth to spawn. Salmon flesh gets its distinctive pink-red color from fat-soluble carotenoids found in the crustaceans on which they feed.



Atlantic salmon

Atlantic salmon is the most important commercially, accounting for one-fourth of all salmon produced worldwide. Extensive aquafarms in Norway, Canada and Scotland produce a steady supply of Atlantic salmon. For marketing purposes, the fish's point of origin is often added to the name (for example, Norwegian, Scottish or Shetland Atlantic salmon). Atlantic salmon have a rich pink color and moist flesh. Their average weight is from four to 12 pounds (1.8 to 5.4 kilograms). Wild Atlantic salmon are almost never available.



Chinook or king salmon

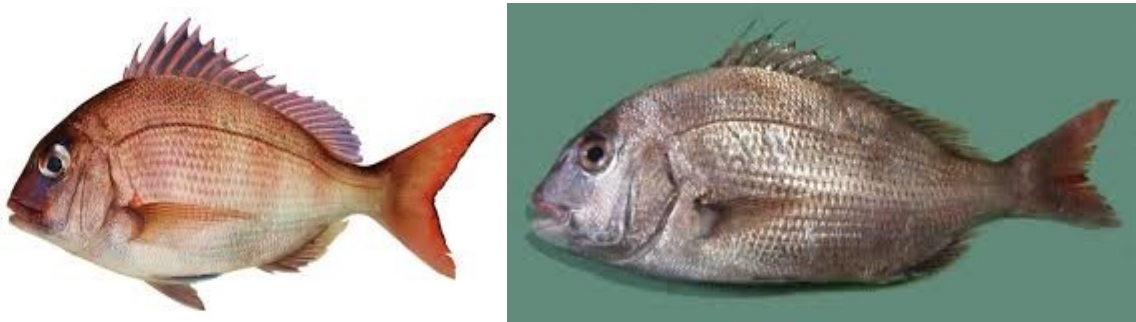
Chinook or king salmon from the Pacific are also highly desirable. They average from five to 30 pounds (2.2 to 13.2 kilograms) and have red-orange flesh with a high fat content and rich flavor. Like other salmon, their flesh separates into large flakes when cooked. Chinooks are often marketed by the name of the river from which they are harvested (for example, Columbia, Yukon or Copper Chinook salmon). They are distinguished by the black interior of their mouth.



Coho salmon

Coho or silver salmon have a pinkish flesh and are available fresh or frozen, wild or from aquafarms. Wild Coho average from 3 to 12 pounds (1.3 to 5.4 kilograms), while aqua farmed Coho are much smaller, usually less than 1 pound (450 grams). Other varieties, such as chum, sockeye, red, blueback and pink salmon, are usually canned but may be available fresh or frozen.

Salmon can be prepared by many cooking methods: broiling, grilling, poaching, steaming or baking. Frying is not recommended, however, because of their high fat content. Salmon fillets are often cured or smoked. Gravlox is salmon that has been cured for one to three days with salt, sugar and dill. Lox is salmon that has been cured in a salted brine and then, typically, cold-smoked. Nova is used in the eastern United States to refer to a less-salty, cold-smoked salmon.



Sea bream

Sea bream is the name given to a large family of fish found in the Mediterranean (gilt-head bream), the Caribbean (porgy), the Atlantic (black sea bream) and the Indo-Pacific (emperor and snapper). Because the marketing term bream is applied to so many different fish, it is difficult to generalize about their characteristics. Some have very few bones, others have quite a few; some have a rich flavor, others are very mild; some weigh up to 20 pounds (9.6 kilograms), others rarely exceed 5 pounds (kilograms). Black sea bream, for example, is a good pan fish, reaching only 35 cm in length and weighing less than 6 pounds (2.9 kilograms). Their flesh is firm, mild and low in fat. Also marketed as Thai snapper, they are good for baking, grilling or frying.



Mako shark



Sand sharks

Sharks provide delicious eating, despite their less-than-appealing appearance and vicious reputation. Mako and blue sharks are the most desirable, with mako often being sold as swordfish. Sand shark, sharp-nose, blacktip, angel and thresher are also available commercially. Most sharks have lean flesh with a mild flavor and firm texture. The flesh is white with tinges of pink or red when raw, turning off-white when cooked. Makos weigh from 30 to 250 pounds (13.5 to 112.5 kilograms); other species may reach as much as 1000 pounds (450 kilograms). All sharks have cartilaginous skeletons and no bones; therefore, they are not actually fish, but rather marine invertebrates. Sharks are usually cut into loins or wheels, then into steaks or cubes. They can be broiled, grilled, baked or fried. An ammonia smell indicates that the shark was not properly treated when caught. Do not buy or eat it.



Swordfish

Swordfish take their name from the long, sword like bill extending from their upper jaw. These popular fish average about 250 pounds (112.5-kilograms). Their flesh is lean and sweet with a very firm, meat-like texture; it may be gray, pink or off-white when raw, becoming white when cooked. Swordfish are most often available cut into wheels or portioned into steaks perfect for grilling or broiling.



Tilapia

Tilapia is the name given to several species of freshwater, aquafarm -raised fish bred worldwide. They grow quickly in warm water, reaching about 3 pounds (1.3 kilograms); they are available whole or filleted, fresh or frozen. The flesh is similar to catfish - lean, white and sweet, with a firm texture. Tilapia are sometimes marketed as cherry snapper or sunshine snapper, even though they are not members of the snapper family.



Pompano

The Atlantic pompano has been described as “the world’s most edible fish.” The attractive, silvery skin is edible and does not require scaling. Pompano meat is firm but finely flaked, with a sweet, mild flavor. The flesh is pearly white, with a moderate fat content, and cooks up white. The **Florida pompano** (*Trachinotus carolinus*) is a species of marine fish in the *Trachinotus* (pompano) genus of the family Carangidae. It has a compressed body and short snout; coloration varies from blue-greenish silver on the dorsal areas and silver to yellow on the body and fins. Pompano contain phosphorus, vitamin B1, B12, copper, vitamin A, and potassium in high sizes. In addition, pompano is also high in amino acids, antioxidants, and large amounts of protein.

*Rainbow trout**Lake trout*

Trout are members of the salmon family. Most of the freshwater trout commercially available are aquafarm -raised rainbow trout, although brown trout and brook trout are also being aqua-farmed. Some trout species spend part of their lives at sea, returning to fresh water to spawn. On the West Coast, these are called salmon trout or steel-head. Trout have a low to moderate fat content, a flaky texture and a delicate flavor that can be easily overwhelmed by strong sauces. The flesh may be white, orange or pink. Trout are usually marketed at 8 to 10 ounces (225 to 280 grams) each, just right for an individual portion. Lake trout, sometimes known as char, are not aqua-farmed and have little commercial value because of their extremely high fat content. Trout can be baked, pan-fried, smoked or steamed.

*Bluefin tuna**Albacore tuna*

*Yellowfin tuna**Bonito tuna*

Tuna varieties include the Bluefin, yellow fin, bonito, bigeye and black fin. Ahi is the popular market name for either yellowfin or bigeye tuna. All are members of the mackerel family and are found in tropical and subtropical waters around the world. Tuna are large fish, weighing up to several hundred pounds each. Bluefin, the finest and most desirable for sashimi, are becoming very scarce because of overfishing. Regular canned tuna is usually prepared from yellowfin or skip jack; canned white tuna is prepared from albacore, also known as longfin tuna. Pacific tuna that is frozen at sea to preserve its freshness is referred to as clipper fish. Any of these species may be found fresh or frozen, however. Tuna is usually cut into four boneless loins for market. The loins are then cut into steaks, cubes or chunks. The flesh has a low to moderate fat content (a higher fat content is preferred for sashimi) and a deep red color. The dark, reddish-brown muscle that runs along the lateral line is very fatty and can be removed. Tuna flesh turns light gray when cooked and is very firm, with a mild flavor. Tuna work well for grilling or broiling and may be marinated or brushed with seasoned oil during cooking. Tuna are often prepared medium rare to prevent dryness.

*Wahoo*

Wahoo, also known as ono) are found throughout tropical and subtropical waters, but are particularly associated with Hawaii (ono even means "good to eat" in Hawaiian). They are actually a type of mackerel and are cooked like any other mackerel.



Lake Whitefish

Whitefish species inhabit the freshwater lakes and streams of North America. Lake Whitefish, the most important commercially, are related to salmon. They are marketed at up to 7 pounds (3.2 kilograms) and are available whole or filleted. The flesh is firm and white, with a moderate amount of fat and a sweet flavor. Whitefish may be baked, broiled, grilled or smoked and are often used in processed fish products.

FLAT FISH



Southern flounder

Flounder have lean, firm flesh that is pearly or pinkish-white with a sweet, mild flavor. Although they are easily boned, most are de-headed and gutted at sea and sold as fresh or frozen fillets.

These fillets are very thin and can dry out or spoil easily, so extra care should be taken in handling, preparing and storing them. Recipes that preserve moisture work best with flounder: poaching, steaming and frying are recommended. Many types of flounder are marketed as sole, perhaps in an attempt to cash in on the popularity of true sole. The FDA permits this practice.

Flounder (also known as Sole) By Location

Atlantic Ocean

- Black back/Winter flounder/Lemon sole Fluke/Summer flounder
- Starry flounder Yellowtail flounder Windowpane flounder
- Gray sole/Witch flounder

Pacific Ocean

- Arrow tooth
- Petrale sole Rex sole English sole Rock sole Sand sole Yellowfin sole
- Domestic Dover sole/Pacific flounder
- Butter sole

English sole are actually flounder caught off the West Coast of the United States. They are usually marketed simply as "fillet of sole." They are a plentiful species of fair to average quality.



Petrale sole

Petrale sole, another West Coast flounder, are generally considered the finest of the domestic "soles." They are most often available as fillets, which tend to be thicker and firmer than other sole fillets.



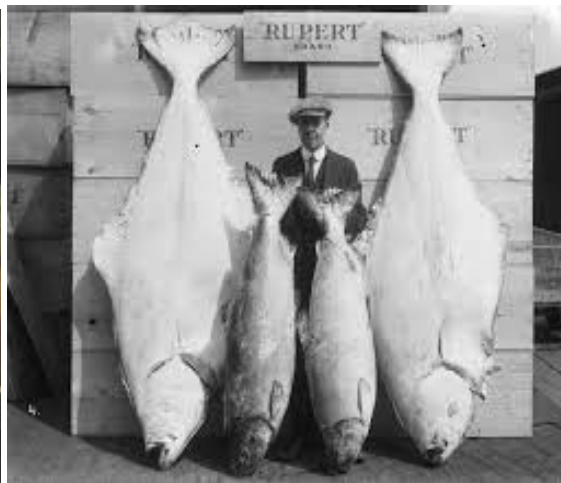
Pacific flounder

Domestic Dover sole are also Pacific flounder. They are not as delicate or flavorful as other species of sole or flounder. Moreover, they are often afflicted with a parasite that causes their flesh to have a slimy, gelatinous texture. Domestic Dover sole are not recommended if other sole or flounder are available.

Lemon sole are the most abundant and popular East Coast flounder. They are also known as black back or winter flounder (during the winter, they migrate close to shore from the deeper, colder waters). They average 2 pounds (900 grams) in weight.



Pacific halibut



Halibut & salmon

Halibut are among the largest flat fish; they often weigh up to 300 pounds (135 kilograms). The FDA recognizes only two halibut species: Atlantic (eastern) and Pacific (northern, Alaskan, western) halibut. Both have lean, firm flesh that is snow-white with a sweet, mild flavor. California halibut, which are actually flounder, are similar in taste and texture but average only 12 pounds (5.4 kilograms) each. Halibut may be cut into boneless steaks or skewered on brochettes. The flesh, which dries out easily, can be poached, baked, grilled or broiled and is good with a variety of sauces.

Sole are probably the most flavorful and finely textured flatfish. Indeed, because of the connotations of quality associated with the name, "sole" is widely used for many species that are not members of the Soleidae family. Even though the FDA allows many species of flatfish to be called "sole" for marketing purposes, no true sole is commercially harvested in American waters. Any flatfish harvested in American waters and marketed as sole is actually flounder. True Dover sole, a staple of classic cuisine, are a lean fish with pearly-white flesh and a delicate flavor that can stand up to a variety of sauces and seasonings. They are a member of the Soleidae family and come only from the waters off the coasts of England, Africa and Europe. They are imported into this country as fresh whole fish or fresh or frozen fillets.



Turbot on sea bottom



Turbot

Turbot are a Pacific flatfish of no great culinary distinction. In Europe, however, the species known as turbot are large diamond-shaped fish highly prized for their delicate flavor and firm, white flesh. They are also marketed as brill.

Nutrition

Fish and shellfish are low in calories, fat and sodium, and are high in protein and vitamins A, B and D. Fish and shellfish are also high in minerals, especially calcium (particularly in canned fish with edible bones), phosphorus, and potassium and iron (especially mollusks). Fish are high in a group of polyunsaturated fatty acids called omega-3, which may help combat high blood cholesterol levels and aid in preventing some heart disease. Shellfish are not as high in cholesterol as was once thought. Crustaceans are higher in cholesterol than mollusks, but both have considerably lower levels than red meat or eggs.

The cooking methods used for fish and shellfish also contribute to their healthfulness. The most commonly used cooking methods are broiling, grilling, poaching and steaming-add little or no fat.

Inspection

Unlike mandatory meat and poultry inspections, fish and shellfish inspections are voluntary. They are performed in a fee-for-service program supervised by the United States Department of Commerce (USDC).

Type 1 - inspection services cover plant, product and processing methods from the raw material to the final product. The "Packed under Federal Inspection" (PUFI) mark or statement can be used on product labels processed under Type 1 inspection services. It signifies that the product is safe and wholesome, is properly labeled, has reasonably good flavor and odor and was produced under inspection in an official establishment.



Packed under Federal Inspection (PUFI)

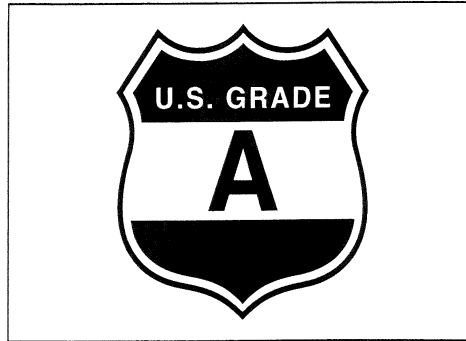
Type 2 - inspection services are usually performed in a warehouse, processing plant or cold storage facility on specific product lots. A lot inspection determines whether the product complies with purchase agreement criteria (usually defined in a spec sheet) such as condition, weight, labeling and packaging integrity.

Type 3 - inspection services are for sanitation only. Fishing vessels or plants that meet the requirements are recognized as official establishments and are included in the *USDC Approved List of Fish Establishments and Products*. The list is available to governmental and institutional purchasing agents as well as to retail and restaurant buyers. Updated copies of the list are published on the Internet.

Grading

Only fish processed under Type 1 inspection services are eligible for grading. Each type of fish has its own grading criteria, but because of the great variety of fish and shellfish, the USDC has been able to set grading criteria for only the most common types. The grades assigned to fish are A, B or C. Grade A products are top quality and must have good flavor and odor and be practically free of physical blemishes or defects. The great majority of fresh and frozen fish and

shellfish consumed in restaurants is Grade A. Grade B indicates good quality; Grade C indicates fairly good quality. Grade B and C products are most often canned or processed.



PURCHASING and STORING FISH and SHELLFISH

Determining Freshness

Because fish and shellfish are highly perishable, an inspection stamp does not necessarily ensure top quality. A few hours at the wrong temperature or a couple of days in the refrigerator can turn high-quality fish or shellfish into garbage. It is important that chefs be able to determine for themselves the freshness and quality of the fish and shellfish they purchase or use. Freshness should be checked before purchasing and again just before cooking.

Determined freshness by the following criteria:

- **Smell** - This is by far the easiest way to determine freshness. Fresh fish should have a slight sea smell or no odor at all. Any off-odors or ammonia odors are a sure sign of aged or improperly handled fish.
- **Eyes** - The eyes should be clear and full. Sunken eyes mean that the fish is drying out and is probably not fresh.
- **Gills**- The gills should be intact and bright red. Brown gills are a sign of age.
- **Texture** - Generally, the flesh of fresh fish should be firm. Mushy flesh or flesh that does not spring back when pressed with a finger is a sign of poor quality or age.
- **Fins and scales** - Fins and scales should be moist and full without excessive drying on the outer edges. Dry fins or scales are a sign of age; damaged fins or scales may be a sign of mishandling.
- **Appearance** - Fish cuts should be moist and glistening, without bruises or dark spots. Edges should not be brown or dry.

- **Movement** - Shellfish should be purchased live and should show movement. Lobsters and other crustaceans should be active. Clams, mussels and oysters that are partially opened should snap shut when tapped with a finger. (Exceptions are geoduck, razor and steamer clams whose siphons protrude, preventing the shell from closing completely.) Ones that do not close are dead and should not be used. Avoid mollusks with broken shells or heavy shells that might be filled with mud or sand.

Purchasing Fish and Shellfish

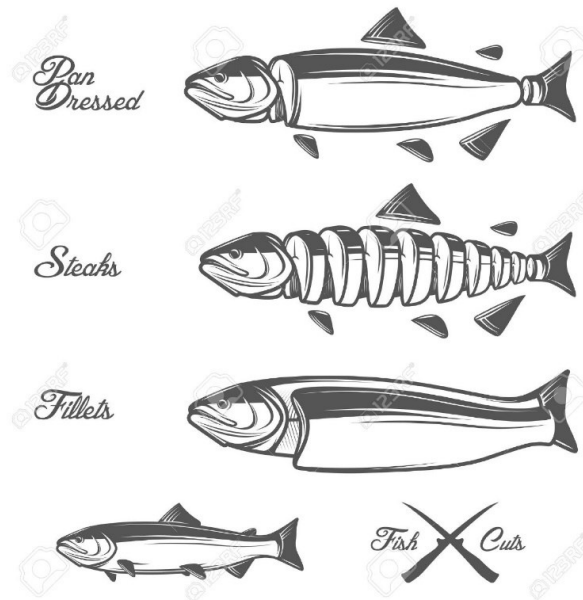
Fish are available from wholesalers in a variety of market forms:

- **Whole or round** - As caught, intact.
- **Drawn-Viscera** - (internal organs) are removed; most whole fish are purchased this way.

Seafood Terminology

- ✓ **Fresh** - The item is not and has never been frozen.
- ✓ **Chilled** - Now used by some in the industry to replace the more ambiguous "fresh"; indicates that the item was refrigerated, that is, held at 30°F to 34°F (- 1°C to 1 °C).
- ✓ **Flash-frozen** - The item was quickly frozen on board the ship or at a processing plant within hours of being caught.
- ✓ **Fresh-frozen** - The item was quick-frozen while still fresh but not as quickly as flash-frozen.
- ✓ **Frozen** - The item was subjected to temperatures of 0°F (- 18°C) or lower to preserve its inherent quality.
- ✓ **Glazed** - A frozen product dipped in water; the ice forms a glaze that protects the item from freezer burn.
- ✓ **Fancy** - Code word for "previously frozen." **Dressed** - Viscera, gills, fins and scales are removed.
- ✓ **Pan-dressed** - Viscera and gills are removed; fish is scaled and fins and tail are trimmed. The head is usually removed, although small fish, such as trout, may be pan-dressed with the head still attached. Pan -dressed fish are then pan-fried.
- ✓ **Butterflied** - A pan-dressed fish, boned and opened flat like a book. The two sides remain attached by the back or belly skin.
- ✓ **Fillet** - The side of a fish removed intact, boneless or semiboneless, with or without skin.

- ✓ **Steak** - A cross-section slice, with a small section of backbone attached; usually prepared from large round fish such as salmon, swordfish or tuna.
- ✓ **Wheel or center-cut** - Used for swordfish and sharks, which are cut into large boneless pieces from which steaks are then cut.



Preparation Cuts for Fish

Chefs purchase fish in the market forms most practical for each operation. Although fish fabrication is a relatively simple chore requiring little specialized equipment, before deciding to cut fish on premises, consider the following:

1. The food service operation's ability to utilize the bones and trim that cutting whole fish produces
2. The employees' ability to fabricate fillets, steaks or portions as needed
3. The storage facilities
4. The product's intended use

Most shellfish can be purchased live in the shell, shucked (the meat removed from the shell) or processed. Both live and shucked shellfish are usually purchased by counts (that is, the number

per volume). For example, standard live Eastern oysters are packed 200 to 250 (the count) per bushel (the unit of volume); standard Eastern oyster meats are packed 350 per gallon. Crustaceans are sometimes packed by size based on the number of pieces per pound; for example, crab legs or shrimp are often sold in counts per pound. Crustaceans are also sold either by grades based on size (whole crabs) or by weight (lobsters).

STORING FISH and SHELLFISH

The most important concern when storing fish and shellfish is temperature. All fresh fish should be stored at temperatures between 30°F and 34°F (- 1°C to 1°C). Fish stored in a refrigerator at 41°F (5°C) will have approximately half the shelf life of fish stored at 32°F (0°C).

Most fish are shipped on ice and should be stored on ice in the refrigerator as soon as possible after receipt. Whole fish should be layered directly in crushed or shaved ice in a perforated pan so that the melted ice water drains away. If crushed or shaved ice is not available, cubed ice may be used provided it is put in plastic bags and gently placed on top of the fish to prevent bruising and denting. Fabricated and portioned fish may be wrapped in moisture-proof packaging before icing to prevent the ice and water from damaging the exposed flesh. Fish stored on ice should be drained and re-iced daily.

Fresh scallops, fish fillets that are purchased in plastic trays and oyster and clam meats should be set on or packed in ice. Do not let the scallops, fillets or meats come into direct contact with the ice.

Clams, mussels and oysters should be stored at 41°F (5°C), at high humidity and left in the boxes or net bags in which they were shipped. Under ideal conditions, shellfish can be kept alive for up to one week. Never store live shellfish in plastic bags and do not ice them.

If a saltwater tank is not available, live lobsters, crabs and other crustaceans should be kept in boxes with seaweed or damp newspaper to keep them moist. Most crustaceans circulate salt water over their gills; icing them or placing them in fresh water will kill them. Lobsters and crabs will live for several days under ideal conditions.

Like most frozen foods, frozen fish should be kept at temperatures of 0°F (-18°C) or colder. Colder temperatures greatly increase shelf life. Frozen fish should be thawed in the refrigerator; once thawed, they should be treated like fresh fish.

~Procedure for Scaling Fish~

This procedure is used to remove the scales from fish that will be cooked with the skin on.

1. Place the fish on a work surface or in a large sink.

2. Grip the fish by the tail and, working from the tail toward the head, scrape the scales off with a fish scaler or the back of a knife. Be careful not to damage the flesh by pushing too hard.
3. Turn the fish over and remove the scales from the other side.
4. Rinse the fish under cool water.

~Procedure for Pan-Dressing Flatfish~

1. Place the scaled fish on a cutting board and remove the head by making a V-shaped cut around it with a chef's knife. Pull the head away and remove the viscera.
2. Rinse the fish under cold water, removing all traces of blood and viscera from the cavity.
3. Using a pair of kitchen shears, trim off the tail and all of the fins.

~Procedure for Filleting Round Fish~

Round fish produce two fillets, one from either side.

1. Using a chef's knife, cut down to the backbone just behind the gills. Do not remove the head.
2. Turn the knife toward the tail; using smooth strokes, cut from head to tail, parallel to the backbone. The knife should bump against the backbone so that no flesh is wasted; you will feel the knife cutting through the small pin bones. Cut the fillet completely free from the bones. Repeat on the other side.
3. Trim the rib bones from the fillet with a flexible boning knife.

~Procedure for Filleting Flat Fish~

Flatfish produce four fillets: two large bilateral fillets from the top and two smaller bilateral fillets from the bottom. If the fish fillets are going to be cooked with the skin on, the fish should be scaled before cooking (it is easier to scale the fish before it is filleted). If the skin is going to be removed before cooking, it is not necessary to scale the fish.

1. With the dark side of the fish facing up, cut along the backbone from head to tail with the tip of a flexible boning knife.
2. Turn the knife and, using smooth strokes, cut between the flesh and the rib bones, keeping the flexible blade against the bone. Cut the fillet completely free from the fish. Remove the second fillet, following the same procedure.
3. Turn the fish over and remove the fillets from the bottom half of the fish, following the same procedure.

~Procedure for Skinning Dover Sole~

Dover sole is unique in that its skin can be pulled from the whole fish with a simple procedure. The flesh of other small flatfish such as flounder, Petrale sole and other types of domestic sole is more delicate; pulling the skin away from the whole fish could damage the flesh. These fish should be skinned after they are filleted.

1. Make a shallow cut in the flesh perpendicular to the length of the fish, just in front of the tail and with the knife angled toward the head of the fish.
2. Using a clean towel, grip the skin and pull it toward the head of the fish. The skin should come off cleanly, in one piece, leaving the flesh intact.

~Procedure for Skinning Fish Fillets~

Use the same procedure to skin all types of fish fillets.

1. Place the fillet on a cutting board with the skin side down.
2. Starting at the tail, use a meat slicer or a chef's knife to cut between the flesh and skin.
3. Angle the knife down toward the skin, grip the skin tightly with one hand and use a smooth sawing motion to cut the skin cleanly away from the flesh.

~Procedure for Pulling Pin Bones from Salmon Fillets~

Round fish fillets contain a row of intramuscular bones running the length of the fillet. Known as pin bones, they are usually cut out with a knife to produce bone- less fillets. In the case of salmon, they can be removed with salmon tweezers or small needle -nose pliers.

1. Place the fillet (either skinless or not) on the cutting board, skin side down.
2. Starting at the front or head end of the fillet, use your fingertips to locate the bones and use the pliers to pull them out one by one.

Various Cooking Methods. Fish and shellfish can be prepared by the dry-heat cooking methods of broiling and grilling, roasting (baking), sautéing, pan-frying and deep-frying , as well as the moist-heat cooking methods of steaming, poaching and simmering.

Determining Doneness

Unlike most meats and poultry, nearly all fish and shellfish are inherently tender and should be cooked just until done. Indeed, overcooking is the most common mistake made when preparing fish and shellfish. The Canadian Department of Fisheries recommends that all fish be cooked 10 minutes for every inch (2.5 centimeters) of thickness, regardless of cooking method. Although this may be a good general policy, variables such as the type and the form of fish and the exact

cooking method used suggest that one or more of the following methods of determining doneness are more appropriate for professional food service operations:

- ✓ **Translucent flesh becomes opaque** - The raw flesh of most fish and shellfish appears somewhat translucent. As the proteins coagulate during cooking, the flesh becomes opaque.
- ✓ **Flesh becomes firm** - The flesh of most fish and shellfish firms as it cooks. Doneness can be tested by judging the resistance of the flesh when pressed with a finger. Raw or undercooked fish or shellfish will be mushy and soft. As it cooks, the flesh offers more resistance and springs back quickly.
- ✓ **Flesh separates from the bones easily** - The flesh of raw fish remains firmly attached to the bones. As the fish cooks, the flesh and bones separate easily.
- ✓ **Flesh begins to flake** - Fish flesh consists of short muscle fibers separated by thin connective tissue. As the fish cooks, the connective tissue breaks down and the groups of muscle fibers begin to flake, that is, separate from one another. Fish is done when the flesh begins to flake. If the flesh flakes easily, the fish will be overdone and dry.

Remember, fish and shellfish are subject to carryover cooking. Because they cook quickly and at low temperatures, it is better to undercook fish and shellfish and allow carryover cooking or residual heat to finish the cooking process.

DRY-HEAT COOKING METHODS

Dry-heat cooking methods are those that do not require additional moisture at any time during the cooking process. The dry-heat cooking methods used with fish and shellfish are broiling and grilling, roasting (usually referred to as baking when used with fish and shellfish), sautéing, pan-frying and deep-frying.

BROILING and GRILLING

After brushing with oil or butter, fish can be grilled directly on the grate or placed on a heated platter under the broiler. Broiled or grilled fish should have a lightly charred surface and a slightly smoky flavor as a result of the intense radiant heat of the broiler or grill. The interior should be moist and juicy. Broiled or grilled shellfish meat should be moist and tender with only slight coloration from the grill or broiler.

Selecting Fish and Shellfish to Broil or Grill

Nearly all types of fish and shellfish can be successfully broiled or grilled. Salmon, trout, swordfish and other oily fish are especially well suited to grilling, as are lean fish such as bass and snapper. Fillets of lean flatfish with delicate textures, such as flounder and sole, are better

broiled. They should be placed on a preheated broiling (sizzler) platter before being placed under the broiler.

Oysters and clams are often broiled on the half shell with flavored butters, bread crumbs or other garnishes and served sizzling hot. Squid can be stuffed, secured with a tooth pick and broiled or grilled. Brushed with butter, split lobsters, king crabs and snow crabs are often broiled or grilled. Whole lobsters can be split and broiled or grilled, or their tails can be removed, split and cooked separately. Large crab legs can also be split and broiled or grilled. Shrimp and scallops are often broiled in flavored butters or grilled on skewers for easy handling.

Seasoning Fish and Shellfish to Be Broiled or Grilled

- All fish should be brushed lightly with butter or oil before being placed on the grill or under the broiler. The butter or oil prevents sticking and helps leaner fish retain moisture.
- For most fish, a simple seasoning of salt and pepper suffices.
- Most fish do respond well to marinades, especially those made with white wine and lemon juice. Because most fish are delicately flavored, they should be marinated for only a brief time. (Even marinated fish should be brushed with butter or oil before cooking.) Herbs should be avoided because they will burn from the intense heat of the broiler or grill.
- Clams, oysters and other shellfish that are stuffed or cooked with butters, vegetables, bacon or other accompaniments or garnishes gain flavor from these ingredients.
- Be careful, however, not to overpower the delicate flavors of the shellfish by adding too many strong flavorings.

Accompaniments to Broiled and Grilled Fish and Shellfish

Lemon wedges are the traditional accompaniment to broiled or grilled fish and shellfish. They can be served with sauces made separately. Butter sauces such as a beurre blanc are popular, as their richness complements the lean fish. Vegetable coulis are a good choice for a healthier, lower-fat accompaniment. If the item is cooked on a broiler platter with a seasoned butter, it is often served with that butter. Almost any side dish goes well with broiled or grilled fish or shellfish. Fried or boiled potatoes, pasta and rice are all good choices. Grilled vegetables are a natural choice.

~Procedure for Broiling or Grilling Fish and Shellfish~

All fish is delicate and must be carefully handled to achieve an attractive finished product. When broiling whole fish or fillets with their skin still on, score the skin by making several diagonal slashes approximately ¼ inch (6 millimeters) deep at even intervals. This prevents the fish from

curling during cooking, promotes even cooking and creates a more attractive finished product. Be especially careful not to overcook the item. It should be served as hot as possible as soon as it is removed from the broiler or grill.

1. Heat the broiler or grill.
2. Use a wire brush to remove any charred or burnt particles that may be stuck to the broiler or grill grate. The grate can be wiped with a lightly oiled towel to remove any remaining particles and help season it.
3. Prepare the item to be broiled or grilled. For example, cut the fish into steaks or tranches of even thickness; split the lobster, peel and/or skewer the shrimp. Season or marinate the item as desired. Brush the item with oil or butter.
4. Place the item on a grill, presentation side down. If using a broiler, place the item directly on the grate or on a preheated broiler platter. Tender fish are usually broiled presentation side up on a broiler platter.

BAKING

The terms baking and roasting are used interchangeably when applied to fish and shellfish. One disadvantage of baking fish is that the short baking time does not allow the surface of the fish to caramelize. To help correct this problem, fish can be browned in a sauté pan with a small amount of oil to achieve the added flavor and appearance of a browned surface, and then finished in an oven.

Selecting Fish and Shellfish to Bake

Fatty fish produce the best-baked fish. Fish fillets and steaks are the best market forms to bake, as they cook quickly and evenly and are easily portioned. Although lean fish can be baked, it tends to become dry and must be basted often.

Seasoning Fish and Shellfish for Baking

The most popular seasonings for baked fish are lemon, butter, salt and pepper. Fish can also be marinated before baking for added flavor. Baked fish usually depend on the accompanying sauce for much of their flavor.

Shellfish are often stuffed or mixed with other ingredients before baking. For example, raw oysters on the half shell can be topped with spinach, watercress and Pernod (oysters Rockefeller) and baked. Shrimp are often butterflied, stuffed and baked; lobsters are split, stuffed, and baked. Many food service operations remove clams from their shells; mix them with breadcrumbs, seasonings or other ingredients; refill the shells and bake the mixture.

~Procedure for Baking Fish and Shellfish~

1. Portion the fish or shellfish and arrange on a well-oiled or buttered pan, presentation side up.
2. Season as desired and brush the surface of the fish or shellfish generously with melted butter; add garnishes or flavorings as desired or directed in the recipe.
3. Place the pan in a preheated oven at approximately 400°F (200°C).
4. Baste periodically during the cooking process (more often if the fish is lean). Remove from the oven when the fish is slightly underdone.

SAUTEING

Sautéing is a very popular cooking method for fish and shellfish. It lightly caramelizes the food's surface, giving it additional flavor. Typically, other ingredients such as garlic, onions, vegetables, wine and lemon juice are added to the fond to make a sauce.

Selecting Fish and Shellfish to Sauté

Both fatty and lean fish may be sautéed. Flatfish are sometimes dressed and sautéed whole, as are small round fish such as trout. Larger fish such as salmon can be cut into steaks or filleted and cut into tranches. The portions should be relatively uniform in size and thickness and fairly thin to promote even cooking. Although clams, mussels and oysters are not often sautéed, scallops and crustaceans are popular sauté items.

Seasoning Fish and Shellfish to Be Sautéed

Many types of fish - especially sole, flounder and other delicate, lean fish fillets - are dredged in plain or seasoned flour before sautéing. Seasoned butter is used to sauté some items, such as scampi-style shrimp. These items derive their flavor from the butter; additional seasonings should not be necessary.

Cooking Temperatures

The sauté pan and cooking fat must be hot before the fish or shellfish are added. Do not add too much fish or shellfish to the pan at one time, or the pan and fat will cool, letting the foods simmer in their own juices. Thin slices and small pieces of fish and shellfish require a short cooking time, so use high temperatures in order to caramelize their surfaces without overcooking. Large, thick pieces of fish or shellfish being cooked in the shell may require slightly lower cooking temperatures to ensure that they are cooked without overbrowning their surfaces.

Accompaniments to Sautéed Fish and Shellfish

Sautéed fish and shellfish are nearly always served with a sauce made directly in the sauté pan. This sauce may be as simple as browned butter (beurre noisette) or a complicated sauce flavored

with the fond. In some cases, seasoned butter is used to sauté the fish or shellfish and the butter is then served with the main item. Mildly flavored rice and pasta are good choices to serve with sautéed fish or shellfish.

~Procedure for Sautéing Fish and Shellfish~

1. Cut or portion the fish or shellfish.
2. Season the item and dredge in seasoned flour if desired.
3. Heat a suitable sauté pan over moderate heat; add enough oil or clarified butter to cover the bottom to a depth of about 1/s inch (3 millimeters).
4. Add the fish or shellfish to the pan (fish should be placed presentation side down); cook until done, turning once halfway through the cooking process. Add other foods as called for in the recipe.
5. Remove the fish or shellfish. If a sauce is to be made in the sauté pan, follow the appropriate procedures.

Pan-frying

Pan-frying is very similar to sautéing, but it uses more fat to cook the main item. Pan-fried fish is always coated with flour, batter or breading to help seal the surface and prevent the flesh from coming into direct contact with the cooking fat. Properly prepared pan-fried fish and shellfish should be moist and tender with a crisp surface. If battered or breaded, the coating should be intact with no breaks.

Selecting Fish and Shellfish to Pan-Fry

Both fatty and lean fish may be pan-fried. Trout and other small fish are ideal for pan-frying, as are portioned fillets of lean fish such as halibut. Pan-fried fish and shellfish should be uniform in size and relatively thin so that they cook quickly and evenly.

Seasoning Fish and Shellfish to Be Pan-Fried

Although fish and shellfish can be marinated or seasoned directly, it is more common to season the flour, batter or breading that will coat them. Batters, for example, can contain cheese, and breading can contain nuts and other ingredients to add different flavors to the fish or shellfish. Additional seasonings come from sauces and other accompaniments served with the pan-fried fish or shellfish.

Cooking Temperatures

The fat should always be hot before the fish or shellfish are added. Breaded or battered fish fillets cook very quickly, and the fat should be hot enough to brown the coating without overcooking

the interior. Whole pan-fried fish take longer to cook and therefore require a slightly lower cooking temperature so that the surface does not become too dark before the interior is cooked.

Accompaniments to Pan-Fried Fish and Shellfish

Lemon wedges are the classic accompaniment to pan-fried fish and shellfish. Sauces that accompany pan-fried items are made separately. Mayonnaise-based sauces such as Tartar Sauce and Remoulade Sauce are especially popular; rich wine-based sauces should be avoided. Vegetable coulis, such as tomato, also complement many pan-fried items.

~Procedure for Pan-Frying Fish and Shellfish~

1. Heat enough clarified butter or oil in a heavy sauté pan so that it will come one-third to halfway up the side of the item. The fat should be at a temperature between 325°F and 350°F (163°C and 177°C).
2. Add the floured, breaded or battered item to the pan, being careful not to splash the hot fat. Cook until done, turning once halfway through the cooking process.
3. Remove the food and drain on absorbent paper.
4. Serve it promptly with an appropriate sauce.

Deep-frying

Deep-frying is the process of cooking foods by submerging them in hot fat. Typically, fish or shellfish are breaded or battered before deep-frying. Alternatively, they can be formed into croquettes or fritters. Properly deep-fried fish and shellfish should be moist and tender, not greasy or tough. Their coating should be crispy and golden brown.

Selecting Fish and Shellfish to Deep-Fry

Whole small fish and fillets of lean fish such as catfish or halibut are excellent for deep-frying. The fillets should be of uniform size and relatively thin so that they cook quickly and evenly. Fatty fish, such as salmon, are ideal for croquettes. Peeled shrimp and shucked mollusks, especially clams and oysters, can be breaded, battered or formed into fritters and deep-fried. Deep-fried breaded or battered sliced squid or octopus served with a dipping sauce makes an excellent hors d'oeuvre.

Seasoning Fish and Shellfish to Be Deep-Fried

Typically, seasonings used for deep-fried fish or shellfish are added to the breading or batter, although salt and pepper should be added after frying. Additional flavors come from sauces or accompaniments.

~Procedure for Deep-Frying Fish and Shellfish~

1. Shuck, peel, cut, trim or otherwise prepare the fish or shellfish to be deep-fried. Season, bread or batter it, as desired.
2. Heat the fat to the desired temperature, usually around 350°F (177°C).
3. Breaded or battered fish or shellfish cook quickly and the fat must be hot enough to cook the food's interior without burning its surface.
4. Carefully place the food in the hot fat using either the basket method or the swimming method.
5. Deep-fry the fish or shellfish until done. Doneness is usually determined by color, timing or sampling.
6. Remove the deep-fried food from the fat and hold it over the fryer, allowing the excess fat to drain off. Transfer the food to a hotel pan either lined with absorbent paper or fitted with a rack. Season with salt, if desired.
7. If the deep-fried fish or shellfish is to be held for later service, place it under a heat lamp.

MOIST-HEAT COOKING METHODS

Fish and shellfish lend themselves well to moist-heat cooking methods, especially steaming, poaching and simmering. Steaming best preserves the food's natural flavors and cooks without adding fat. Poaching is also popular, especially for fish. Poached fish can be served hot or cold, whole or as steaks, fillets or portions. Boiling, which is actually simmering, is most often associated with crustaceans.

Steaming

Steaming is a very natural way to cook fish and shellfish without adding fats. Fish are steamed by suspending them over a small amount of boiling liquid in a covered pan. The steam trapped in the pan gently cooks the food while preserving its natural flavors and most nutrients. The liquid used to steam fish and shellfish can be water or a court bouillon with herbs, spices, aromatics or wine added to infuse the item with additional flavors. Mussels and clams can be steamed by placing them directly in a pan, adding a small amount of wine or other liquid and covering them. Their shells will hold them above the liquid as they cook. Fish and shellfish can also be steamed by wrapping them in parchment paper together with herbs, vegetables, butters or sauces as accompaniments and baking them in a hot oven. This method of steaming is called **en papillote**.

Steamed fish and shellfish should be moist and tender. They should have clean and delicate flavors. Any accompaniments or sauces should complement the main item without masking its

flavor. Fish and shellfish cooked en papillote should be served piping hot so that the aromatic steam trapped by the paper escapes as the paper is cut open tableside.

Selecting Fish and Shellfish to Steam

Mollusks (for example, clams and mussels), fatty fish (for example, salmon or sea bass) and lean fish (for example, sole) all produce good results when steamed. The portions should be of uniform thickness and no more than 1 inch (2.5 centimeters) thick to promote even cooking.

Seasoning Fish and Shellfish to Be Steamed

Steamed fish and shellfish rely heavily on their natural flavors and often require very little seasoning. Nevertheless, salt, pepper, herbs and spices can be applied directly to the raw food before steaming. Flavored liquids used to steam fish and shellfish will contribute additional flavors. If the liquid is served with the fish or shellfish as a broth or used to make a sauce to accompany the item, it is especially important that the liquid be well seasoned. Lemons, limes and other fruits or vegetables can also be cooked with the fish or shellfish to add flavors. Clams and mussels often do not require additional salt, as the liquor released when they open during cooking is sufficiently salty.

Accompaniments to Steamed Fish and Shellfish

Steamed fish and shellfish are popular partly because they are low in fat. In keeping with this perception, a low or nonfat sauce or a simple squeeze of lemon and steamed fresh vegetables are good accompaniments. If fat is not a concern, then an emulsified butter sauce such as Beurre Blanc or Hollandaise may be a good choice.

Classic New England steamed clams are served with a portion of the steaming liquid; steamed mussels are served with a sauce that is created from the wine and other ingredients used to steam them.

~Procedure for Steaming Fish and shellfish~

1. Portion the fish to an appropriate size. Clean the shellfish.
2. Prepare the cooking liquid. Add seasoning and flavoring ingredients as desired and bring to a boil.
3. Place the fish or shellfish in the steamer on a rack or in a perforated pan and cover tightly.
4. Steam the fish or shellfish until done.
5. Serve the fish or shellfish immediately with the steaming liquid or an appropriate sauce.

Poaching

Poaching is a versatile and popular method for cooking fish. Shellfish are rarely poached, however. The exception is squid, which can be quickly poached and chilled for use in salads and other preparations.

There are two distinct poaching methods.

The **first** is the **submersion method**, in which the fish is completely covered with a liquid, usually a court bouillon, fish stock or fish fumet. It is cooked until just done. The poached fish is then served (either hot or cold) with a sauce sometimes made from a portion of the cooking liquid but more often made separately. Whole fish (wrapped in cheesecloth to preserve its shape during cooking), tranches and steaks can all be cooked by submersion poaching.

The **second method**, called **shallow poaching**, combines poaching and steaming to achieve the desired results. The main item, usually a fillet, tranche or steak, is placed on a bed of aromatic vegetables in enough liquid to come approximately halfway up its sides. The liquid, called a **cuisson**, is brought to a simmer on the stovetop. The pan is then covered with a piece of buttered parchment paper or a lid, and cooking is completed either on the stovetop or in the oven. Shallow-poached fish is usually served with a sauce made with the reduced cooking liquid. (Sometimes the main item is sautéed lightly before the cooking liquid is added. If so, the cooking method is more accurately braising, as both dry- and moist-heat cooking methods are used.)

Selecting Fish to Poach

Lean white fish such as turbot, bass and sole are excellent for poaching. Some fatty fish such as salmon and trout are also excellent choices.

Seasoning Fish to Be Poached

Fish poached by either submersion or shallow poaching gain all of their seasonings from the liquid in which they are cooked and the sauce with which they are served. Therefore, it is very important to use a properly prepared court bouillon, fish fumet or a good-quality fish stock well-seasoned with vegetables such as shallots, onions or carrots as well as ample herbs, spices and other seasonings. Many poached fish recipes call for wine. When using wine in either the cooking liquid or the sauce, be sure to choose a wine of good quality. Most fish are very delicately flavored, and using poor-quality wine might ruin an otherwise excellent dish. Citrus, especially lemon, is a popular seasoning; lemon juice or zest may be added to the poaching liquid, the sauce or the finished dish.

Accompaniments to Poached Fish

Poached fish cooked by submersion go well with rich sauces such as hollandaise and beurre blanc. If fat is a concern, a better choice may be a vegetable coulis (for example, broccoli or red pepper). Cold poached fish are commonly served with mayonnaise-based sauces such as sauce

verte or remoulade. Shallow -poached fish are served with sauces such as a white wine sauce or beurre blanc made from a reduction of the liquids in which the fish were poached. Poached fish are often served with rice or pasta and steamed or boiled vegetables.

~Procedure for Poaching fish~

1. Prepare the cooking liquid. Whole fish should be started in a cold liquid; gradually increasing the liquid's temperature helps preserve the appearance of the fish. Portioned fish should be started in a simmering liquid to preserve their flavor and more accurately estimate cooking time.
2. Use a rack to lower the fish into the cooking liquid. Be sure the fish is completely submerged.
3. Poach the fish at 175°F- 185°F (79°C--85°C) until done.
4. Remove the fish from the poaching liquid, moisten with a portion of the liquid and hold in a warm place for service. Alternatively, remove the fish from the poaching liquid, cover it to prevent drying and allow it to cool, then refrigerate.
5. Serve the poached fish with an appropriate sauce.

Classroom Preparation Assignment
Topic Four

Fin Fish- Flat and Round

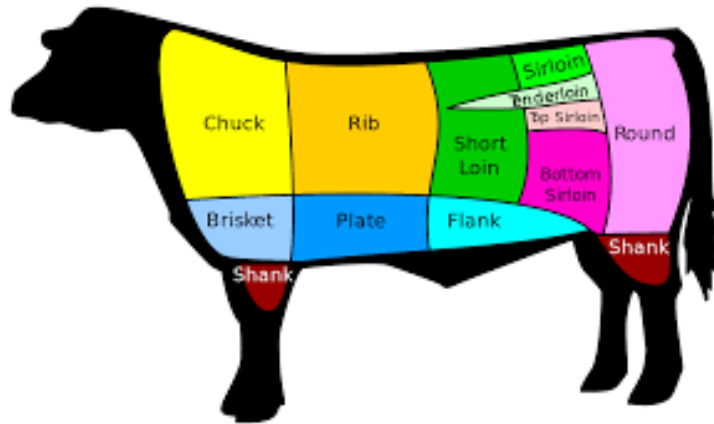
Name: _____ Date: _____

1. Round fish swim in a _____ position and have eyes on _____ of their head.
2. Flat fish have asymmetrical _____ bodies and swim in a _____ position.
3. Sea bass, Atlantic Cod, Salmon, and Catfish are all examples of _____ fish.
4. Flounder, Sole, Halibut, and Turbot are examples of _____ fish.
5. When a fish is “dressed”, what is removed? _____, _____, _____, and _____.
6. A fish steak indicates a _____ with a small section of _____ attached.
7. Describe the method for filleting flatfish.
8. Describe the method for filleting flatfish.
9. T or F (circle one). The discussed methods for preparing round and flat fish include: sautéing, broiling, grilling, baking, panfrying, deep frying, steaming, and poaching.
10. Is deep frying a dry or moist cooking method? _____.

Topic 5:
Beef Identification and Fabrication



BEEF



Beef is the meat of domesticated cattle. Most of the beef Americans eat comes from steers, which are male cattle castrated as calves and specifically raised for beef. Although Americans are consuming less beef today in comparison to past eating habits, we still consume far more beef than any other meat. The beef we are eating is leaner than that of years past attributable to advances in animal husbandry and closer trimming of exterior fat.

PRIMAL AND SUBPRIMAL BEEF CUTS

After the steer is slaughtered, it is cut into four pieces (called quarters) for easy handling. This is done by first splitting the carcass down the backbone into two bilateral halves. Each half is divided into the forequarter (the front portion) and the hindquarter (the rear portion) by cutting along the natural curvature between the 12th and 13th ribs. The quartered carcass is then further reduced into the primal cuts and the sub primal and fabricated cuts.

The primal cuts of beef are the chuck, brisket and shank, rib, short plate, short loin, sirloin, flank and round. It is important to know the location of bones when cutting or working with meats. This makes meat fabrication and carving easier and aids in identifying cuts. F An entire beef carcass can range in weight from 500 to more than 800 pounds (225 to 360 kg).

FOREQUARTER

Chuck

The primal chuck is the animal's shoulder; it accounts for approximately 28 percent of carcass weight. It contains a portion of the backbone, five rib bones and portions of the blade and arm bones. Because an animal constantly uses its shoulder muscles, chuck contains a high percentage

of connective tissue and is quite tough. This tough cut of beef, however, is one of the most flavorful.

The primal chuck is used less frequently than other primal cuts in food service operations. If cooked whole, the chuck is difficult to cut or carve because of the large number of bones and relatively small muscle groups that travel in different directions. The primal chuck produces several fabricated cuts: cross rib pot roast, chuck short ribs, cubed or tenderized steaks, stew meat and ground chuck.

Because the meat is less tender, the fabricated cuts usually benefit from moist-heat cooking or combination cooking methods such as stewing and braising. There are exceptions, however. The beef industry is developing new products from underutilized cuts of meat. **Flat iron** comes from the top shoulder of the chuck and is one such cut gaining in popularity as an alternative steak suitable for dry-heat cooking.

Cattle is the collective name for all domesticated oxen (genus Bos). Cattle are classified as follows:

1. **Bulls** - male cattle, usually not raised to be eaten.
2. **Calves** - young cows or bulls prized for their meat.
3. **Cows** - female cattle after their first calving raised in this country principally for milk and calf production. In France, cows are used for beef when they are no longer needed for milk.
4. **Heifers** - young cows or cows before their first calving. Heifer meat and organs are becoming increasingly popular as a food source.
5. **Stags** - male cattle castrated after maturity, principally used for dog food. Steers- male cattle castrated prior to maturity and principally raised for beef.

BRISKET and SHANK

The brisket and shank are located beneath the primal chuck on the front half of the carcass. Together, they form a single primal that accounts for approximately 8 percent of carcass weight. This primal consists of the steer's breast (the brisket), which contains the ribs and breastbone, and its arm (the fore shank), which contains only the shank bone.

The ribs and breastbone are always removed from the brisket before cooking. The boneless brisket is very tough and contains a substantial percentage of fat, both intermuscular and subcutaneous. It is well suited for moist-heat and combination cooking methods such as simmering or braising. It is often pickled or corned to produce corned beef brisket, or cured and peppered to make pastrami.

Beef fore shanks are very flavorful and high in collagen. Because collagen converts to gelatin when cooked using moist heat, fore shanks are excellent for making soups and stocks. Ground shank meat is often used to help clarify and flavor consommés because of its rich flavor and high collagen content.

RIB

The primal beef rib accounts for approximately 10 percent of carcass weight. It consists of ribs 6 through 12 as well as a portion of the backbone. This primal is best known for yielding roast prime rib of beef. Prime rib is not named after the quality grade USDA Prime. Rather, its name reflects the fact that it constitutes the majority of the primal cut. The eye meat of the rib (the center muscle portion) is not a well-exercised muscle and therefore is quite tender. It also contains large amounts of marbling compared to the rest of the carcass and produces rich, full-flavored roasts and steaks. Although roasting the eye muscle on the rib bones produces a moister roast, the eye meat can be removed to produce a boneless rib eye roast or cut into ribeye steaks. The rib bones that are separated from the rib eye meat are quite meaty and flavorful and can be served as barbecued beef ribs. The ends of the rib bones that are trimmed off the primal rib to produce the rib roast are known as beef short ribs. They are meaty and are often served as braised beef short ribs.

SHORT PLATE

The short plate is located directly below the primal rib on a side of beef; it accounts for approximately 9 percent of the overall weight of the carcass. The short plate contains rib bones and cartilage and produces the short ribs and skirt steak.

Short ribs are meaty, yet high in connective tissue, and are best when braised. Skirt steak is often marinated and grilled as fajitas. Other, less meaty portions of the short plate are trimmed and ground.

HIND QUARTER

Short Loin

The short loin is the anterior (front) portion of the beef loin. It is located just behind the rib and becomes the first primal cut of the hindquarter when the side of beef is divided into a fore-quarter and hindquarter. It accounts for approximately 8 percent of carcass weight. The short loin contains a single rib, the 13th, and a portion of the backbone. With careful butchering, this small primal can yield several sub primal and fabricated cuts, all of which are among the most tender, popular and expensive cuts of beef.

The loin eye muscle, a continuation of the rib eye muscle, runs along the top of the I-shaped bones that form the backbone. Beneath the loin eye muscle on the other side of the backbone is the tenderloin, the tenderest cut of all.

When the short loin is cut in cross-sections with the bone in, it produces - starting with the rib end of the short loin club steaks (which do not contain any tenderloin), **T-bone steaks** (which contain only a small portion of tenderloin), and **porterhouse steaks** (cut from the sirloin end of the short loin, and contain a large portion of tenderloin).

The whole tenderloin can also be removed and cut into **chateaubriand**, **filet mignon**, and **tournedos**. A portion of the tenderloin is located in the sirloin portion of the loin. When the entire beef loin is divided into the primal short loin and primal sirloin, the large end of the tenderloin (the butt tenderloin) is separated from the remainder of the tenderloin and remains in the sirloin; the smaller end of the tenderloin (the short tenderloin) remains in the short loin. If the tenderloin is to be kept whole, it must be removed before the short loin and sirloin are separated. The loin eye meat can be removed from the bones, producing a boneless strip loin, which is very tender and can be roasted or cut into boneless strip steaks.

Sirloin

The sirloin is located in the hindquarter, between the short loin and the round. It accounts for approximately 7 percent of carcass weight and contains part of the backbone as well as a portion of the hipbone.

The sirloin produces bone-in or boneless roasts and steaks that are flavorful and tender. With the exception of the tenderloin portion, however, these subprimals and fabricated cuts are not as tender as those from the strip loin are. Cuts from the sirloin are cooked using dry-heat methods such as broiling, grilling or roasting.

Flank

The flank is located directly beneath the loin, posterior to (behind) the short plate. It accounts for approximately 6 percent of carcass weight. The flank contains no bones.

Although quite flavorful, it is a less tender cut with a good deal of fat and connective tissue. Flank meat is usually trimmed and ground, with the exception of the **flank steak** or **London broil**. The flank also contains a small piece of meat known as the hanging tenderloin. Although not actually part of the tenderloin, it is very tender and can be cooked using any method.

ROUND

The primal round is very large, weighing as much as 200 pounds (90 kg) and accounting for approximately 24 percent of carcass weight. It is the hind leg of the animal and contains the round, aitch, shank and tailbones.

Meat from the round is flavorful and tender. The round yields a wide variety of subprimal and fabricated cuts: the top round, outside round, eye round (the outside round and the eye round together are called the bottom round), knuckle and shank. Steaks cut from the round are less tender, but because they have large muscles and limited intermuscular fat, the top round and knuckle make good roasts. The bottom round is best when braised. The hind shank is prepared in the same fashion as the fore shank.

Organ Meats

Several organ meats find use in food service operations. This group of products is known as offal. It includes the heart, kidney, tongue, tripe (stomach lining) oxtail, and pigs feet. Offal benefits from moist-heat cooking and are often used in soup, stew or braised dishes.

Nutrition

Beef is a major source of protein and the primary food source of zinc as well as B vitamins, trace minerals and other nutrients. While well-marbled beef does contain a high percentage of saturated fat, lean cuts of beef such as eye round and top round roasts, top sirloin and shoulder pot roast have less fat than chicken thighs, a standard level of comparison. Excess fat should be trimmed as much as possible before cooking and serving.

~Procedures for Butchering~

Although many food service operations buy their beef previously cut and portioned, it is still important for a cook to be able to fabricate cuts of beef and perform basic butchering tasks.



Photo: Pixabay

~Procedure for Trimming a Full Beef Tenderloin~

1. Cut and pull the excess fat from the entire tenderloin to expose the meat.
2. Remove the chain muscle from the side of the tenderloin. (Although it contains much connective tissue, the chain muscle may be trimmed and the meat used as tenderloin trimmings in various dishes.)
3. Trim away all of the fat and silver skin. Do so by loosening a small piece of silver skin; then, holding the loosened silver skin tightly with one hand, cut it away in long strips, angling the knife up toward the silver skin slightly so that only the silver skin is removed and no meat is wasted.
4. Cut the tenderloin as desired into (left to right) tips, chateaubriand, filet mignon, tournedos tips, and tenderloin tips.

~Procedure for Butterflying Meats~

Many cuts of boneless meats such as tenderloin steaks and boneless pork chops can be butterflied to create a thinner cut that has a greater surface area and cooks more quickly.

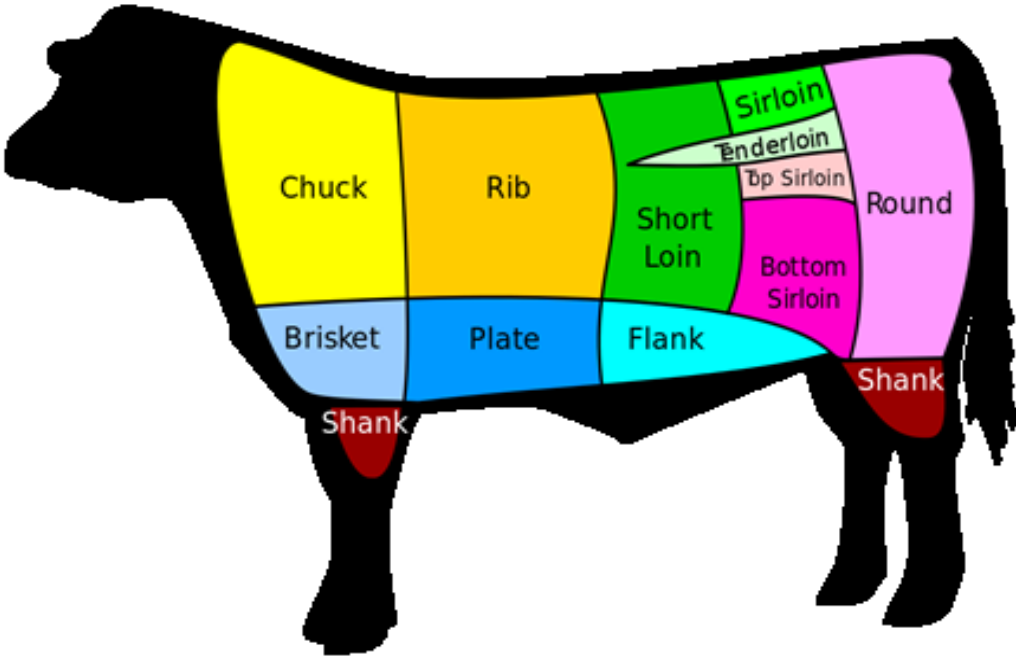
1. Make the first cut nearly all the way through the meat, keeping it attached by leaving approximately $\frac{1}{4}$ inch (6 millimeters) uncut.
2. Make a second cut, this time cutting all the way through, completely removing the steak from the tenderloin.

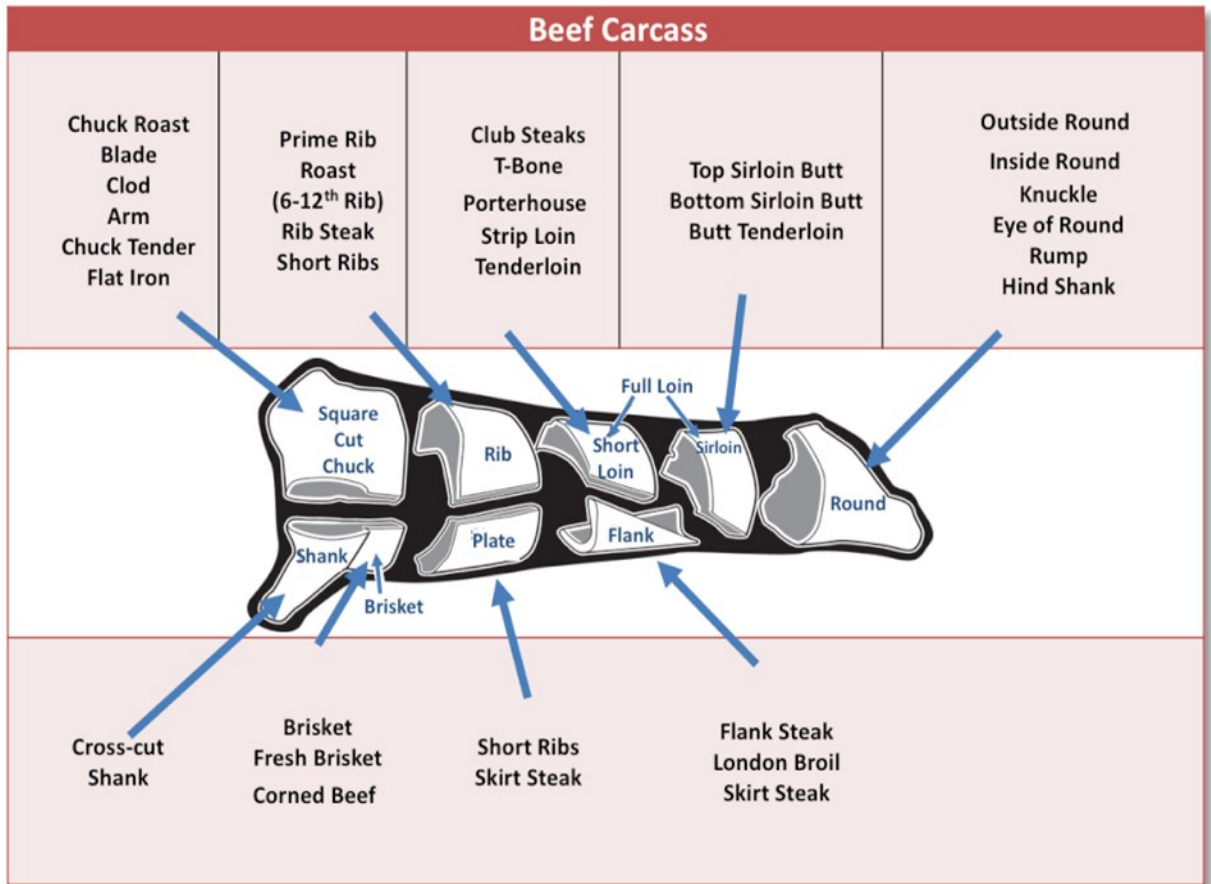


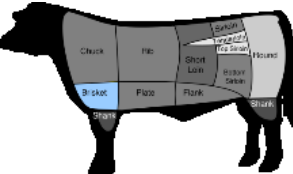
Beef Ribeye butterflied- flickr

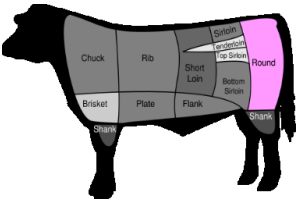
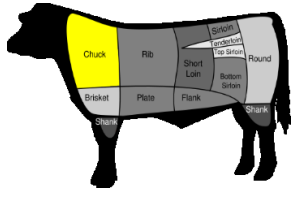
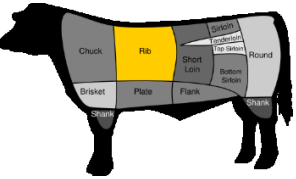
From Primal to Table

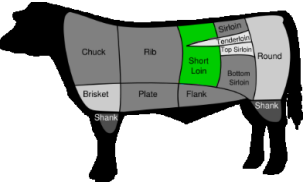
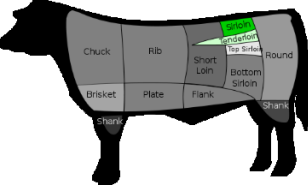
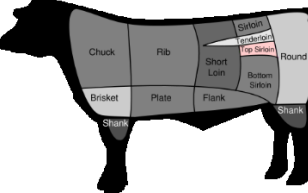
PRIMAL	FABRICATED CUT	IMPS	COOKING METHODS	SERVING SUGGESTIONS
Chuck	Top blade (flat iron)	114D	Dry heat (broil or grill)	Steak; fajitas
	Chuck roll, tied	116A	Combination (braise; stew)	Pot roast; beef stew
	Stew meat	135A	Combination (stew)	Beef stew
	Ground beef	136	Dry heat (broil or grill; roast)	Hamburgers; meatloaf
Brisket and dinner	Brisket	120	Combination (braise; stew)	Chili con came; beef stews
			Moist heat (simmer)	Corned beef; New Eng. boiled
Shank				
hash	Shank	117	Combination (braise)	Pot roast
			Combination (braise)	Shredded beef for tamales or
Rib	Oven-ready rib roast	109	Dry heat (roast)	Roast prime rib
	Rib eye roll	112	Dry heat (roast)	Roast prime rib
Short plate				
	Skirt steak	121D	Dry heat (broil or grill)	Steak; fajitas
	Short ribs	123A	Combination (braise)	Braised short ribs
Forequarter Above				
Hindquarter Below				
Short loin				
steak; roast; bordelaise	Porterhouse or Strip loin	173, 174 180	Dry heat (broil or grill) Dry heat (broil or grill;	Steaks T-bone steaks New York steak; minute sauté) entrecôte
	Tenderloin	189	Dry heat (broil or grill; roast)	Tournedos Rossini; beef
Wellington	Top sirloin butt	184	Dry heat (broil or grill; roast)	Steak; roast beef
Sirloin	Tri tip	185	Dry heat (broil or grill; roast)	Steak; stir-fry; fajitas
Flank				
	Flank steak	193	Dry heat (broil or grill) Combination (braise)	London broil Braised stuffed flank steak
Round				
	Steamship round	160	Dry heat (roast)	Roast beef
	Top (inside) round	168	Dry heat (roast) Combination (braise)	Roast beef Braised beef roulade





<p>Beef Brisket</p> 	<p>Primal: one of the eight primal cuts Meat Buyer's Guide variations: 120, 120A, 120B, 120C Weight Ranges: 4 lb. -12 up. Best Cooking Methods: braising, slow cooking, smoking, stewing, pot roasting Common Cuts: Full Brisket, Flat, Point</p>	<p>The cut of choice used by BBQ masters. Other uses: corned beef, pastrami, pot roast, and is common at Passover feasts. Beef Brisket is usually an inexpensive cut.</p>
	<p>Primal: beef bottom round is part of the "round" primal cut Meat Buyer's Guide variations: 170, 170A,</p>	<p>Look for a short, thick piece with some fat left on it. The longer, leaner options are</p>

<p>Bottom Round</p> 	<p>171, 171A, 171B, 171C Weight Ranges: 3 lb. -31 up.</p> <p>Cooking Methods: braising, slow cooking, stewing, pot roasting Common Cuts: Gooseneck, Faux Filet Mignon, Chip Steak, Eye of Round</p>	<p>less desirable as they will be tougher while lacking flavor. The meat itself should have a bright, cherry-red color with fat speckled throughout the muscle. Check that the muscle is firm to the touch.</p>
<p>Chuck Roast</p> 	<p>Primal: beef chuck is a primary primal cut. Meat Buyer's Guide variations: 113, 114A, 114B, 114C, 114D, 114E, 115, 115A, 115B, 115C, 116, 116A, 116B, 116C, 116D, 116E Weight Ranges: 1 lb. to 88 lb.</p> <p>Best Cooking Methods: braising, slow cooking, stewing, pot roasting Common Cuts: Square-cut Chuck, Cross-cut Chuck, Flatiron Steak, Shoulder Tender, Eye Roast, Under-Blade Steak</p>	<p>The chuck is essentially a whole cow shoulder, also known as a clod, and when removed from the forequarter is called a cross-cut chuck. It weighs about 100 pounds, and makes up roughly 23% of the carcass.</p>
<p>Prime Rib</p> 	<p>Primal: beef prime is one a primary primal cut. Meat Buyers Guide variations: 104, 107, 107A, 108, 109, 109A, 109B, 109C, 109D, 109E, 110, 111, 112, 112A Weight Ranges: 3 lb. -30 up.</p> <p>Best Cooking Methods: slow cooking, roasting, grilling, broiling Cut Variations: roasts, steaks</p> <p>Best beef grades, from highest to lowest, are as follows: USDA Prime, USDA Choice, USDA Select, USDA Standard, USDA, Commercial.</p>	<p>Prime Rib Cooking Temperatures</p> <ul style="list-style-type: none"> • Rare 110°-115° • MR 120°-125° • Medium 130°-135° • MW 140°-150° • Well (not advisable)

<p>Beef Short Loin</p> 	<p>Primal: beef short loin is a primary primal cut. Meat Buyers Guide variations: 173, 174, 175, 180, part of 172, and 172A. Weight Ranges: 14 lb. -57-up. Best Cooking Methods: slow cooking, roasting, grilling, broiling Cut Variations: roasts, steaks</p>	<p>Home to various steaks that we all know and love — the Delmonico, the Porterhouse, the T-Bone — all of which are among the most tender, popular and expensive cuts of beef</p>
<p>Tenderloin of Beef</p> 	<p>Primal: beef tenderloin is part of the Loin Primal Cut Meat Buyers Guide variations: 189, 189A, 189B, 190, 190A, 191, 191A, 191B, 192, 192A Weight Ranges: 1 lb. – 7-up. Best Cooking Methods: roasting, grilling, broiling Cut Variations: roasts, steaks</p>	<p>Beef tenderloin, aka Fillet Mignon, is the tenderest cut of meat a cow.</p>
<p>Top Sirloin</p> 	<p>Primal: top sirloin is part of the “sirloin” primal cut Meat Buyer’s Guide variations: 184, 184A, 184B, 184C, 184D, 184E Weight Ranges: 1 lb. -14 up. Best Cooking Methods: roasting, grilling, broiling</p>	<p>There are two varieties of sirloin steak available, from the sirloin primal, between the short loin primal (behind the ribs), and round primal (the rump). The bottom sirloin for ground meat, or cut it into chunks for stewing or braising</p>

Inspection & Grading of Meat and Poultry: What Are the Differences?

Source: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/production-and-inspection/inspection-and-grading-of-meat-and-poultry-what-are-the-differences/_inspection-and-grading-differences

The inspection and grading of meat and poultry are two separate programs within the U.S. Department of Agriculture (USDA). Inspection for wholesomeness is **mandatory** and is paid for with public funds. Grading for quality is **voluntary**, and the service is requested and paid for by meat and poultry producers/processors.

- ✓ [Mandatory Federal Inspection](#)
- ✓ [Voluntary Federal inspection](#)
- ✓ [Grading](#)
- ✓ [USDA Grades for Meat and Poultry](#)
- ✓ [Beef](#)
- ✓ [Quality Grades](#)
- ✓ [Yield grades](#)
- ✓ [Veal/Calf](#)
- ✓ [Lamb](#)
- ✓ [Pork](#)
- ✓ [Poultry](#)
- ✓ [Food Safe Families](#)

Mandatory Federal Inspection

American consumers can be confident that the Food Safety and Inspection Service (FSIS), the public health agency in the USDA, ensures that meat and poultry products are safe, wholesome, and correctly labeled and packaged.

Under the [Federal Meat Inspection Act](#) and the [Poultry Products Inspection Act](#), FSIS inspects all raw meat and poultry sold in interstate and foreign commerce, including imported products. The Agency monitors meat and poultry products after they leave federally inspected plants.

In addition, FSIS monitors [State inspection programs](#), which inspect meat and poultry products sold only within the State in which they were produced. The 1967 Wholesome Meat Act and the 1968 Wholesome Poultry Products Act require State inspection programs to be "at least equal to" the Federal inspection program. In states that choose to end their inspection program or cannot maintain this standard, FSIS must assume responsibility for inspection within that State.

FSIS does allow under a final rule State-inspected establishments with 25 or fewer employees to ship meat and poultry products in interstate commerce because of a new voluntary cooperative agreement program. Meat and poultry products produced under the program that have been inspected and passed by designated State personnel will bear an official Federal mark of inspection and will be permitted to be distributed in interstate commerce. FSIS will provide oversight and enforcement of the program.

In these efforts to protect the safety and integrity of meat and poultry products, FSIS works with many other agencies, including other agencies within the USDA, State inspection programs, the [Food and Drug Administration](#) of the U.S. Department of Health and Human Services, and the [Environmental Protection Agency](#).

Since the Federal inspection program began at the turn of the twentieth century, the meat and poultry industries have grown and changed significantly. In the early 1900's, most meat came from local slaughter plants and was used locally. Further processing was limited to simple products such as sausages. Today, however, a wide variety of meat and poultry products are on the market. Animals are slaughtered and meat is processed in sophisticated, high-volume plants. The meat is often shipped great distances to reach consumers.

As the industry changed, FSIS began changing inspection. In earlier days, the primary concern of the inspectors was animal diseases, and they relied almost exclusively on visual inspection of animals, products, and plant operations. However, refinements in animal production reduced disease and created a more homogeneous animal population. Thus, the concerns of today's inspectors are broader and include unseen hazards such as microbiological and chemical contamination.

The requirements in the "[Pathogen Reduction; Hazard Analysis and Critical Control Point \(HACCP\) Systems](#)" [final rule](#) are designed to minimize the likelihood of harmful bacteria contaminating raw meat and poultry products. However, some bacteria could be present and might become a problem if meat and poultry are not handled safely. To assist food handlers, the USDA requires that [safe handling instructions](#) be put on all packages of raw and not fully cooked meat and poultry.



FSIS's HACCP Systems mandate measures to target and reduce the presence of pathogenic organisms in meat and poultry products. These measures include FSIS testing to verify pathogen reduction performance standards are being met; plant microbial testing to verify process control for fecal contamination; written sanitation standard operating procedures (SOPs); and a mandatory HACCP system in all meat and poultry plants. The implementation of HACCP by FSIS helps ensure the safety of the meat, poultry, and egg products supply. To learn more, visit [FSIS's Web page on HACCP](#).

Every establishment is required to reassess the adequacy of its HACCP plan at least annually and whenever any changes occur that could affect its hazard analysis or alter its HACCP plan. The establishment may reassess its HACCP plan, or plans, any time during the calendar year to meet the annual reassessment requirement.

Meat that has been federally inspected and passed for wholesomeness is stamped with a round purple mark. The dye used to stamp the grade and inspection marks onto a meat carcass is made from a food-grade vegetable dye and is not harmful. (The exact formula is proprietary/owned by the maker of the dye.) The mark is put on carcasses and major cuts. After trimming, the mark might not appear on retail cuts such as roasts and steaks. However, meat that is packaged in an inspected facility will have an inspection mark which identifies the plant on the label.

USDA Website: [\[Top of Page\]](#)



Inspection mark on raw meat



Inspection mark on raw poultry



Inspection mark on processed products

Voluntary Federal inspection for animals not covered under mandatory inspection (i.e., buffalo, rabbit, reindeer, elk, deer, and antelope) is handled under the Agricultural Marketing Act. This Act gives the Secretary of Agriculture the authority to take whatever steps are necessary to make the product marketable. The FSIS inspector must have knowledge about that particular species and the carcass must fit available equipment in the plant. Businesses that request voluntary inspection must pay an hourly fee for the service whereas mandatory inspection is funded by tax dollars.

For voluntary inspection, the mark of inspection (as referenced in 9 CFR 352.7-Marking Inspected Products) illustrates the mark to be the shape of a triangle for exotic species.



For application to exotic animal carcasses, primal parts and cuts therefrom, exotic animal livers, exotic animal tongues, and exotic animal hearts.

The establishment number of the official exotic animal establishment where the product is prepared shall be used in lieu thereof.



For the inspection of rabbits, as per 9 CFR 354.63 the mark of inspection is the same as the inspection mark for raw poultry.

USDA Website: [[Top of Page](#)]

Grading

After meat and poultry are inspected for wholesomeness, producers and processors may request that they have products graded for quality by a licensed Federal grader. The [USDA's Agricultural Marketing Service](http://www.ams.usda.gov) (<http://www.ams.usda.gov>) is the agency responsible for grading meat and poultry. Those who request grading must pay for the service. Grading for quality means the evaluation of traits related to tenderness, juiciness, and flavor of meat; and, for poultry, a normal shape that is fully fleshed and meaty and free of defects.

USDA grades are based on nationally uniform Federal standards of quality. No matter where or when a consumer purchases graded meat or poultry, it must have met the same grade criteria. The grade is stamped on the carcass or side of beef and is usually not visible on retail cuts. However, retail packages of beef, as well as poultry, will show the U.S. grade mark if they have been officially graded.

The grade symbol and wording are no longer copyrighted; however, according to the Truth in Labeling Law, it is illegal to mislead or misrepresent the shield or wording.

USDA Website: [[Top of Page](#)]

USDA Grades for Meat and Poultry

Beef

Beef is graded as whole carcasses in two ways:

- **quality grades** - for tenderness, juiciness, and flavor; and
- **yield grades** - for the amount of usable lean meat on the carcass. There are eight quality grades for beef. Quality grades are based on the amount of marbling (flecks of fat within the lean), color, and maturity.

USDA Website: [[Top of Page](#)]

Quality Grades:



1. **Prime grade** is produced from young, well-fed beef cattle. It has abundant marbling and is generally sold in restaurants and hotels. Prime roasts and steaks are also excellent for dry-heat cooking due to the age of the animal, and less connective tissue (broiling, roasting, or grilling).



2. **Choice grade** is high quality, but has less marbling than Prime. Choice roasts and steaks from the loin and rib will be very tender, juicy, and flavorful and are, like Prime, suited to dry-heat cooking. Many of the less tender cuts, such as those from the rump, round, and blade chuck, can also be cooked with dry heat if not overcooked. Such cuts will be most tender if "braised" — roasted, or simmered with a small amount of liquid in a tightly covered pan.



3. **Select grade** is very uniform in quality and normally leaner than the higher grades. It is fairly tender, but, because it has less marbling, it may lack some of the juiciness and flavor of the higher grades. Only the tender cuts (loin, rib, sirloin) should be cooked with dry heat. Other cuts should be marinated before cooking or braised to obtain maximum tenderness and flavor.
4. **Standard and Commercial grades** are frequently sold as ungraded or as "store brand" meat.
5. **Utility, Cutter, and Canner** grades are seldom, if ever, sold at retail but are used instead to make ground beef and processed products.

Note: Grades such as Prime, Choice and Select are not acceptable terms for raw cuts of pork or poultry.

USDA Website: [\[Top of Page\]](#)

Yield grades range from "1" to "5" and indicate the amount of usable meat from a carcass. Yield grade 1 is the highest grade and denotes the greatest ratio of lean to fat; yield grade 5 is the lowest yield ratio. Though yield grades are not something consumers normally see, they are most useful when purchasing a side or carcass of beef for the freezer.

[\[Top of Page\]](#)

Veal/Calf

There are five grades for **Veal/Calf**: **prime, choice, good, standard, and utility**.

Prime and **choice** grades are juicier and more flavorful than the lower grades. Because of the young age of the animals, the meat will be a light grayish-pink to light pink, fairly firm, and velvety. The bones are small, soft, and quite red. Cuts such as chops can be cooked by the dry-heat methods of roasting, grilling or broiling.

[\[Top of Page\]](#)

Lamb

There are five grades for lamb. Normally only two grades are found at the retail level — **prime** and **choice**. Lower grades of lamb and mutton (meat from older sheep) — **good**, **utility**, and **cull** — are seldom marked with the grade. Lamb is produced from animals less than a year old. Since the quality of lamb varies according to the age of the animal, it is advisable to buy lamb that has been USDA graded.

1. **Prime grade** is very high in tenderness, juiciness, and flavor. Its marbling enhances both flavor and juiciness.
2. **Choice grade** has slightly less marbling than prime, but still is of very high quality. Most cuts of prime and choice grade lamb (chops, roasts, shoulder cuts, and leg) are tender and can be cooked by the dry-heat methods (broiling, roasting, or grilling). The less tender cuts — breast, riblets, neck, and shank — can be braised to make them tenderer.

Pork

Pork is not graded by USDA quality grades as it is generally produced from young animals that have been bred and fed to produce more uniformly tender meat. Appearance is an important guide in buying fresh pork. Look for cuts with a relatively small amount of fat over the outside and with meat that is firm and grayish pink in color. For best flavor and tenderness, meat should have a small amount of marbling.

Pork's consistency makes it suitable for a variety of cooking styles. Chops can be prepared by pan broiling, grilling, baking, braising, or sautéing. Ribs can be braised, roasted, or grilled. Slow cooking yields the most tender and flavorful results. Tenderloins are considered to be the most tender and tasty cut of pork.

USDA Website: [\[Top of Page\]](#)

Poultry

The USDA grades for poultry are **A**, **B**, and **C**.



- **Grade A** is the highest quality and the only grade that is likely to be seen at the retail level. This grade indicates that the poultry products are virtually free from defects such as bruises, discolorations, and feathers. Bone-in products have no broken bones. For

whole birds and parts with the skin on, there are no tears in the skin or exposed flesh that could dry out during cooking, and a good covering of fat under the skin. Also, whole birds and parts will be fully fleshed and meaty.

The U.S. grade shield for poultry may be found on the following chilled or frozen ready-to-cook poultry products: whole carcasses and parts, as well as roasts, tenderloins, and other boneless and/or skinless poultry products that are being marketed. There are no grade standards for necks, wing tips, tails, giblets, or ground poultry.

- **Grades B and C** poultry are usually used in further-processed products where the poultry meat is cut up, chopped, or ground. If sold at retail, they are usually not grade identified.

Food Safe Families

By following four simple steps, you can help keep your family safe from food poisoning at home.

1. **CLEAN.** Wash hands and surfaces often.
2. **SEPARATE.** Separate raw meats from other foods.
3. **COOK.** Cook food to the right temperature.
4. **CHILL.** Refrigerate food promptly.

For more information about meat and poultry grading, go to USDA's Agricultural Marketing Service (AMS) Web site at www.ams.usda.gov/

United States Department of Agriculture Summary of Federal Inspection Requirements for Meat Products

Source: <https://www.fsis.usda.gov/wps/wcm/connect/e6658a9c-915f-4283-beaf-a827b35e906a/Fed-Food-Inspect-Requirements.pdf?MOD=AJPERES>

The Food Safety Inspection Service (FSIS) is the public health agency in the U.S. Department of Agriculture responsible for ensuring that the Nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged.

Retail/Restaurant/Central Kitchen Exemption(9 CFR 303.1(f)(iv)(a)(6)).

Operations traditionally and usually conducted at retail stores, restaurants, and retail-type establishments that offer meat and meat food products for sale or service to household

consumers generally are exempt from mandatory inspection. Only inspected and passed meat and meat food products (those bearing a mark of inspection) may be used in the preparation of products sold (including meals) at retail stores or restaurants. Sales must be in normal retail quantities, and certain Federal requirements apply (e.g., safe handling labels are required for raw product). Retail stores may prepare product for sale to other than household consumers (i.e., hotels, restaurants, or similar institutions (HRI)), but such HRI sales are limited to the annual dollar value or percentage of total retail sales specified by FSIS regulations. HRI sales also are limited by regulation to certain kinds of products (9 CFR 303.1(d) (2)).

Under certain conditions, products may be prepared at a restaurant central kitchen for sale in another facility without the benefit of inspection. To qualify, such products must be ready-to-eat when they leave the facility and safely transported under strict temperature controls to the destination restaurant where the product will be reheated and served to the end consumer. Product prepared at a central kitchen may only be transported to and prepared by restaurants under the same ownership. *Operations exempt from inspection under the FMIA may be regulated and inspected under State and local laws.*

Federal Inspection (21 U.S.C. 601, et seq.).

The Federal Meat Inspection Act (FMIA) requires that all meat sold commercially be inspected and passed to ensure that it is safe, wholesome, and properly labeled. The USDA Food Safety and Inspection Service (FSIS) is responsible for providing this inspection. The FMIA requires inspection for any product intended for human consumption, wholly or in part, from the carcass or parts of any cattle, sheep, swine, and goat. These animals, defined as “livestock” in the regulations, must be slaughtered and processed under Federal inspection, and the meat food products must be inspected and passed for human consumption. Food products from animals not subject to inspection under the FMIA (non-amenable species) are subject to regulation by U.S. Food and Drug Administration (FDA) and State and local authorities. Federal inspection personnel must be present at all times during livestock slaughter operations and for at least part of each shift during which there is further processing of meat products.

In slaughter plants, inspection personnel verify the humane handling of animals and conduct ante-mortem inspection to ensure that the live animal is fit for slaughter. These inspection personnel also conduct post-mortem inspection to ensure that the meat from the carcass and internal organs are fit for human food. When meat is distributed to other federally inspected establishments for further processing, the product is inspected to ensure that the product is safe, wholesome, and correctly labeled and packaged. Inspected establishments must maintain and follow written Sanitation Standard Operating Procedures (SSOP) and Hazard Analysis and Critical Control Point (HACCP) plans.

In addition to inspecting the meat products, inspection personnel inspect the facilities and equipment to ensure sanitary conditions are maintained. FSIS also reviews records to ensure they accurately document establishment verification that the meat food products are in compliance with all applicable requirements.

State Inspection (21 U.S.C. 661).

Establishments that produce meat products sold entirely within a State require Federal inspection unless they are regulated under a State Meat and Poultry Inspection (MPI) program.

These State MPI programs are required to enforce requirements “at least equal to” those imposed under the Federal Acts.

State MPI programs certify annually, and FSIS reviews each State MPI program annually to determine whether each program meets the requisite “at least equal to” standard. As of September 2015, 27 States maintain cooperative agreements with FSIS to administer MPI programs, and FSIS reimburses a portion of the State’s operating costs. Exemptions: Certain meat products may be exempt from inspection requirements. However, they are still subject to the adulteration and misbranding provisions of the FMIA.

Personal/Individual Use Exemption (9 CFR 303.1(a)(1)).

Under certain conditions, a person may slaughter/ prepare livestock of his/her own raising for the exclusive use by him/her, members of his/her family, and his/her non-paying guests without the benefit of inspection. Absolutely no product produced under this exemption may be sold commercially.

Custom Exemption (9 CFR 303.1(a)(2)).

A custom-exempt establishment is one that slaughters and prepares livestock belonging to someone else for the exclusive use of that person. The custom-exempt facility provides a service for the livestock owner; it is not producing commercial product.

Custom-exempt facilities are exempt from the FMIA requirements for carcass-by-carcass inspections and the daily presence of inspectors during operations. Even so, the facility is not exempt from the adulteration, misbranding, and certain record-keeping provisions of those statutes.

Custom-exempt establishments are reviewed periodically to verify that facilities are maintained and operated in a manner that produces a safe, clean, and wholesome meat food product in a sanitary environment and are otherwise complying with the FMIA.

Ground Beef and Food Safety

Questions about "ground meat" or "hamburger" have always been in the top five food topics of calls to the USDA's Meat and Poultry Hotline. Here are the most frequently asked questions and information about why ground beef requires careful handling.

What's the difference between "hamburger" and "ground beef"?

Beef fat may be added to "hamburger," but not "ground beef." A maximum of 30% fat is allowed in either hamburger or ground beef. Both hamburger and ground beef can have seasonings, but no water, phosphates, extenders, or binders added. The labeling of meat food products must comply with the Federal Meat Inspection Act (FMIA) and the meat inspection regulations and labeling policies.

Most states and cities set standards for store-packaged ground beef which, by law, cannot be less than Federal standards. If products in retail stores were found to contain more than 30% fat, they would be considered "misbranded" under Federal law.

Is ground beef inspected and graded?

All meat transported and sold in interstate commerce must be federally inspected. The U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS) carries out USDA's responsibilities under the Federal Meat Inspection Act. These laws protect consumers by ensuring that meat products are wholesome, unadulterated, and correctly labeled and packaged.

Many states have their own inspection programs that are applicable for meats produced and sold within their borders only. State inspection programs must enforce requirements at least equal to those of Federal inspection laws.

Ground beef exported to the U.S. from USDA-approved eligible nations must meet all safety standards applied to foods produced in the United States. They must employ equivalent sanitary measures that provide the same level of protection against food hazards as is achieved domestically.

Grades are assigned as a standard of quality only. It is voluntary for a company to hire a Federal Grader to certify the quality of its product. Beef grades are USDA Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner. They are set by the USDA Agricultural Marketing Service. Most ground beef is not graded.

What kind of bacteria can be in ground beef? Are they dangerous?

Bacteria are everywhere in our environment; virtually any food can harbor bacteria. In foods of animal origin, pathogenic (illness-causing) bacteria, such as Salmonella, Shiga-toxin producing Escherichia coli (STECs), Campylobacter jejuni, Listeria monocytogenes, and Staphylococcus aureus, cause illness. These harmful bacteria cannot be seen or smelled.

If the pathogens are present when meat is ground, then more of the meat surface is exposed to the harmful bacteria. Also, grinding allows any bacteria present on the surface to be mixed throughout the meat. Bacteria multiply rapidly in the "Danger Zone" — temperatures between 40 and 140 °F (4.4 and 60 °C). To keep bacterial levels low, store ground beef at 40 °F (4.4 °C) or

below and use within 2 days, or freeze. To destroy harmful bacteria, cook ground beef to a safe minimum internal temperature of 160 °F (71.1 °C).

Other bacteria cause spoilage. Spoilage bacteria generally are not harmful, but they will cause food to deteriorate or lose quality by developing a bad odor or feeling sticky on the outside.

Why is the E. coli O157:H7 bacterium of special concern in ground beef?

E. coli O157:H7 is the most well-known Shiga toxin-producing E. coli (STEC), though other STEC strains have also been identified. STECs produce large quantities of a potent toxin that forms in the intestine and causes severe damage to the lining of the intestine. This causes a disease called hemorrhagic colitis, and may also cause Hemolytic Uremic Syndrome, particularly in young children. STECs can colonize in the intestines of animals, which could contaminate muscle meat at slaughter.

E. coli O157:H7 bacteria survive refrigerator and freezer temperatures. Once they get in food, they can multiply very slowly at temperatures as low as 44 °F (6.7 °C). While the actual infectious dose is unknown, most scientists believe it takes only a small number of this strain of E. coli to cause serious illness and even death, especially in children and older adults. The bacteria are killed by thorough cooking, which for ground beef is an internal temperature of 160 °F (71.1 °C) as measured by a food thermometer.

Illnesses caused by E. coli O157:H7 have been linked with the consumption of undercooked ground beef. Other foods, including raw milk, apple cider, dry-cured sausage, fresh produce, and undercooked roast beef, also have been implicated.

How is beef treated in a USDA-inspected plant to reduce bacteria?

The following methods have been extensively studied and found effective in reducing bacterial contamination on a beef carcass: organic acid washes, water washes, steam pasteurization, steam vacuuming, and other antimicrobials.

Why is ground beef produced in a USDA-inspected plant safer than beef ground in a store or at home?

Hearing about recalls of ground beef products contaminated with E. coli O157:H7 or Salmonella might cause some consumers to consider grinding beef at home; however, this is not a safer alternative to purchasing ground beef at a retail store. In fact, USDA cautions against grinding beef at home.

In a USDA-inspected plant, trimmed beef destined for grinding is tested for the presence of E. coli. However, primal cuts, such as steaks and roasts, are usually not tested. When stores or consumers grind these primal cuts, it's possible that pathogens may be present on the raw beef, and neither you nor meat market employees can see, smell, or taste dangerous bacteria.

In addition, USDA-inspected plants have Sanitation Standard Operating Procedures that cover policies such as the cleaning of grinding machines and the handling and chilling of ground beef. Consumers and stores might not follow such stringent sanitary procedures.

How do you know if ground beef sold in a store is from a USDA-inspected establishment?

Ground beef produced at a USDA-inspected plant will have a USDA establishment number on the package, written as "EST." (for "establishment") followed by a number. Much of the ground beef sold in stores today are ground in a USDA-inspected plant; sometimes the store will print the establishment number on its packaging. If you don't see an "EST." number, ask the store about its source for ground beef.

Why are there recalls of ground beef?

Live cattle can harbor various bacteria, including Shiga toxin-producing *E. coli* (STEC) and *Salmonella*. In 1994, the USDA declared *E. coli* O157:H7 as an adulterant in ground beef. In 2012, USDA declared six additional most common STECs as adulterants in raw ground beef as well. Before 1996, the inspection of beef carcasses was by sight, touch, and smell. With the passage of the 1996 Final Rule on Pathogen Reduction; Hazard Analysis and Critical Control Point (PR/HACCP) Systems, FSIS began requiring microbial testing in slaughter plants for *E. coli*. If *E. coli* O157:H7 is detected, recalls are initiated by the manufacturer or distributor of the meat, sometimes at the request of FSIS.

From what cuts of beef are ground beef and hamburger made?

Generally, ground beef is made from the less tender and less popular cuts of beef. Trimmings from more tender cuts may also be used. Grinding tenderizes the meat and the fat reduces its dryness and improves flavor.

What is the significance of the "Sell-By" date on the package?

"Sell-By" dates are a guide for retailers. Although many products bear "Sell-By" dates, product dating is not a Federal requirement. While these dates are helpful to the retailer, they are reliable only if the food has been kept at a safe temperature during storage and handling. USDA suggests that consumers cook or freeze ground beef within 2 days after purchase for maximum quality.

What is the safe food handling label on ground beef packages?

A safe food handling label should be on all raw or partially precooked (not ready-to-eat) meat and poultry packages. The label tells the consumer how to safely store, prepare, and handle raw meat and poultry products in the home.

What is the Country of Origin Label on ground beef packages?

The Country of Origin Label (COOL) is not a food safety issue. It is a law requiring that package labels of certain foods bear the names of the country or countries where the food came from. FSIS enforces the labeling of ground beef.

To find information about COOL, go to <http://www.ams.usda.gov/AMSv1.0/cool>

If you have a food labeling complaint about a country of origin, send your complaint to:

Country of Origin Labeling Division

USDA-AMS

Room 2620-S, Stop 0216

1400 Independence Avenue, SW

Washington, DC 20250-0216

Email: Cool@ams.usda.gov

Can bacteria spread from one surface to another?

Yes. It is called cross-contamination. Bacteria in raw meat juices can contaminate foods that have been cooked safely or raw foods that won't be cooked, such as salad ingredients. Bacteria also can be present on equipment, hands, and even in the air.

To avoid cross-contamination, wash your hands with soap and warm water for at least 20 seconds before and after handling ground beef to make sure you don't spread bacteria. Don't reuse any packaging materials. Use soap and hot water to wash utensils and surfaces which have come into contact with the raw meat. Utensils and surfaces can be sanitized with a solution of 1 tablespoon of unscented, liquid chlorine bleach per gallon of water. Don't put cooked hamburgers on the same platter that held the raw patties or use utensils that touched the raw meat unless you wash the platter or utensils first.

What's the best way to handle raw ground beef when shopping?

At the store, choose a package that feels cold and is not torn. If possible, place the package in a plastic bag so leaking juices won't drip on other foods. Make ground beef one of the last items to go into your shopping cart. Separate raw meat from ready-cooked items in your cart. Have the clerk place the raw ground beef in a separate bag.

Plan to drive directly home from the grocery store. You may want to bring a cooler with ice for perishables.

How should raw ground beef be stored at home?

Refrigerate or freeze ground beef as soon as possible after purchase. This preserves freshness and slows the growth of bacteria. It can be refrigerated or frozen in its original packaging if the meat will be used soon.

If refrigerated, keep at 40 °F (4.4 °C) or below and use within 1 or 2 days.

For longer freezer storage, wrap in heavy duty plastic wrap, aluminum foil, freezer paper, or plastic bags made for freezing. Ground beef is safe indefinitely if kept frozen, but will lose quality over time. It is best if used within 4 months. Mark your packages with the date they were placed in the freezer so you can keep track of storage times.

What is the best way to thaw ground beef?

The best way to safely thaw ground beef is in the refrigerator. Keeping meat cold while it is defrosting is essential to prevent the growth of bacteria. Cook or refreeze within 1 or 2 days.

To defrost ground beef more rapidly, you can defrost in the microwave oven or in cold water. If using the microwave, cook the ground beef immediately because some areas may begin to cook during the defrosting. To defrost in cold water, put the meat in a watertight plastic bag and submerge. Change the water every 30 minutes. Cook immediately. Do not refreeze raw ground meat thawed in cold water or in the microwave oven unless you cook it first.

Never leave ground beef or any perishable food out at room temperature for more than 2 hours (1 hour at 90 °F and above).

The Color of Meat and Poultry

Source: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/meat-preparation/the-color-of-meat-and-poultry/the-color-of-meat-and-poultry/ct_index

Color is important when meat and poultry are purchased, stored, and cooked. Often an attractive, bright color is a consideration for the purchase. So, why are there differences in the color and what do they mean? Listed below are some questions and answers to help you understand the color differences.

1. What factors affect the color of meat and poultry?

Myoglobin, a protein, is responsible for the majority of the red color. Myoglobin doesn't circulate in the blood but is fixed in the tissue cells and is purplish in color. When it is mixed with oxygen, it becomes oxymyoglobin and produces a bright red color. The remaining color comes from the hemoglobin which occurs mainly in the circulating blood, but a small amount can be found in the tissues after slaughter.

Color is also influenced by the age of the animal, the species, sex, diet, and even the exercise it gets. The meat from older animals will be darker in color because the myoglobin level increases with age. Exercised muscles are always darker in color, which means the same animal can have variations of color in its muscles.

In addition, the color of meat and poultry can change as it is being stored at retail and in the home (see explanation in question 5). When safely stored in the refrigerator or freezer, color changes are normal for fresh meat and poultry.

2. Does a change in color indicate spoilage?

Change in color alone does not mean the product is spoiled. Color changes are normal for fresh product. With spoilage there can be a change in color—often a fading or darkening. In addition to

the color change, the meat or poultry will have an off odor, be sticky or tacky to the touch, or it may be slimy. If meat has developed these characteristics, it should not be used.

3. If the color of meat and poultry changes while frozen, is it safe?

Color changes, while meat and poultry are frozen, occur just as they do in the refrigerator. Fading and darkening, for example, do not affect their safety. These changes are minimized by using freezer-type wrapping and by expelling as much air as possible from the package.

4. What are the white dried patches on frozen meat and poultry?

The white dried patches indicate freezer burn. When meat and poultry have been frozen for an extended period of time or have not been wrapped and sealed properly, this will occur. The product remains safe to eat, but the areas with freezer burn will be dried out and tasteless and can be trimmed away if desired.

THE COLOR OF MEAT

5. When displayed at the grocery store, why is some meat bright red and other meat very dark in color?

Optimum surface color of fresh meat (i.e., cherry-red for beef; dark cherry-red for lamb; grayish-pink for pork; and pale pink for veal) is highly unstable and short-lived. When meat is fresh and protected from contact with air (such as in vacuum packages), it has the purple-red color that comes from myoglobin, one of the two key pigments responsible for the color of meat. When exposed to air, myoglobin forms the pigment, oxymyoglobin, which gives meat a pleasingly cherry-red color. The use of a plastic wrap that allows oxygen to pass through it helps ensure that the cut meats will retain this bright red color. However, exposure to store lighting as well as the continued contact of myoglobin and oxymyoglobin with oxygen leads to the formation of metmyoglobin, a pigment that turns meat brownish-red. This color change alone does not mean the product is spoiled (see explanation in question 2).

6. Why is pre-packaged ground beef red on the outside and sometimes grayish-brown on the inside?

These color differences do not indicate that the meat is spoiled or old. As discussed earlier, fresh cut meat is purplish in color. Oxygen from the air reacts with meat pigments to form a bright red color which is usually seen on the surface of ground beef purchased in the supermarket. The interior of the meat may be grayish-brown due to the lack of oxygen penetrating below the surface.

7. A beef roast has darkened in the refrigerator, is it safe?

Yes, it is safe. The darkening is due to oxidation, the chemical changes in myoglobin due to the oxygen content. This is a normal change during refrigerator storage.

8. Can cooked ground beef still be pink inside?

Yes, ground beef can be pink inside after it is safely cooked. The pink color can be due to a reaction between the oven heat and myoglobin, which causes a red or pink color. It can also occur

when vegetables containing nitrites are cooked along with the meat. Because doneness and safety cannot be judged by color, it is very important to use a food thermometer when cooking ground beef. To be sure all harmful bacteria are destroyed, cook raw ground beef to an internal temperature of 160 °F as measured with a food thermometer.

9. What causes iridescent colors on meats?

Meat contains iron, fat, and other compounds. When light hits a slice of meat, it splits into colors like a rainbow. There are various pigments in meat compounds that can give it an iridescent or greenish cast when exposed to heat and processing. Wrapping the meat in airtight packages and storing it away from light will help prevent this situation. Iridescence does not represent decreased quality or safety of the meat.

10. What causes grayish or green color on cured meats?

Exposure to light and oxygen causes oxidation to take place, which causes the breaking down of color pigments formed during the curing process. Chemicals in the cure and oxygen, as well as energy from ultraviolet and visible light, contribute to both the chemical breakdown and microbial spoilage of the product. Cure, such as nitrite, chemically changes the color of muscle. Curing solutions are colored in order to distinguish them from other ingredients (such as sugar or salt) used in fresh and cured meat products. For example, cured raw pork is gray, but cured cooked pork (e.g., ham) is light pink.

The Color of Poultry

11. What is the usual color of raw poultry?

Raw poultry can vary from a bluish-white to yellow. All of these colors are normal and are a direct result of breed, exercise, age, and/or diet. Younger poultry has less fat under the skin, which can cause the bluish cast, and the yellow skin could be a result of marigolds in the feed.

12. What causes the differences in color of raw ground poultry?

Ground poultry varies in color according to the part being ground. Darker pink means more dark meat was used and a lighter pink means more white meat was included (or skin was included). Ground poultry can contain only muscle meat and skin with attached fat in proportion to the whole bird.

13. What causes dark bones in cooked poultry?

Darkening of bones and meat around the bones occurs primarily in young (6-8 weeks) broiler-fryer chickens. Since the bones have not calcified or hardened completely, pigment from the bone marrow seeps through the bones and into the surrounding area. Freezing can also contribute to this darkening. This is an aesthetic issue and not a safety one. The meat is safe to eat when all parts have reached a safe minimum internal temperature of 165 °F as measured with a food thermometer.

14. What color is safely cooked poultry?

Safely cooked poultry can vary in color from white to pink to tan. For safety when cooking poultry, use a food thermometer to check the internal temperature. For a whole chicken or turkey, check the internal temperature in the innermost part of the thigh and wing and the thickest part of the breast. All the meat—including any that remains pink—is safe to eat as soon as all parts reach at least 165 °F as measured with a food thermometer.

15. Why is some cooked poultry pink?

Chemical changes occur during cooking. Oven gases in a heated gas or electric oven react chemically with hemoglobin in the meat tissues to give it a pink tinge. Often meat of younger birds shows the most pink because their thinner skins permit oven gases to reach the flesh. Older animals have a fat layer under their skin, giving the flesh added protection from the gases. Older poultry may be pink in spots where fat is absent from the skin. Also, nitrates and nitrites, which are often used as preservatives or may occur naturally in the feed or water supply used, can cause a pink color.

16. If fully cooked smoked poultry is pink, is it safe?

Poultry grilled or smoked outdoors can be pink, even when all parts have attained temperatures well above 165 °F as measured with a food thermometer. There may be a pink-colored rim about one-half inch wide around the outside of the cooked product. Commercially prepared, smoked poultry is usually pink because it is prepared with natural smoke and liquid smoke flavor.

What is beef?

Source: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/meat-preparation/beef-from-farm-to-table/ct_index!/ut/p/a1/jZDBbsIwDIafZQ9gOaWAXhFVmmgHrRCCZbkgA06JRJMqtbaxp1-3nTYNhn2y_P2y9aFBjcbTi6tJXPB0-pzNeKuWapxMMIVUk-RB5eVmWT1mmbpfjXrg-QpQpjfmL9RU_ZcvbjgwiItsUaNpSY7gvA2oaxYg371y7FDbEA7QkWU5g6W9QHdkln7RMAM0kVuKX0JQ75gt2BiaHowNSACh3YlR72Xr_IHf8AnNz5dU0ndepqvhrChTVQ1_A384-wYuS2mbtX6fT2fK5XcfPTfBRA!!/#1

The domestication of cattle for food dates to about 6500 B.C. in the Middle East. Cattle were not native to America, but brought to the New World on ships by European colonists. Americans weren't big eaters of fresh beef until about 1870, due to the enormous growth of the cattle industry in the West. The introduction of cattle cars and refrigerated cars on the railroad facilitated distribution of the beef.

"Beef" is meat from full-grown cattle about 2 years old. A live steer weighs about 1,000 pounds and yields about 450 pounds of edible meat. There are at least 50 breeds of beef cattle, but fewer than 10 make up most cattle produced. Some major breeds are Angus, Hereford, Charolaise, and Brahman.

"Baby beef" and "calf" are 2 interchangeable terms used to describe young cattle weighing about 700 pounds that have been raised mainly on milk and grass. The meat cuts from baby beef are smaller; the meat is light red and contains less fat than beef. The fat may have a yellow tint due to the vitamin A in grass.

"Veal" is meat from a calf which weighs about 150 pounds. Those that are mainly milk-fed usually are less than 3 months old. The difference between "veal" and "calf" is based on the color of their meat, which is determined almost entirely by diet. Veal is pale pink and contains more cholesterol than beef.

NOTE: This information is about whole muscle beef and variety beef. See "Ground Beef and Food Safety" for information about hamburger and ground beef.

How are cattle raised?

All cattle start out eating grass; three-fourths of them are "finished" (grown to maturity) in feedlots where they are fed specially formulated feed based on corn or other grains.

Can hormones & antibiotics be used in cattle raising?

Antibiotics may be given to prevent or treat disease in cattle. A "withdrawal" period is required from the time antibiotics are administered until it is legal to slaughter the animal. This is so residues can exit the animal's system. FSIS randomly samples cattle at slaughter and tests for residues. Data from this Monitoring Plan have shown a very low percentage of residue violations. Not all antibiotics are approved for use in all classes of cattle. However, if there is a demonstrated therapeutic need, a veterinarian may prescribe an antibiotic that is approved in other classes for an animal in a non-approved class. In this case, no detectable residues of this drug may be present in the edible tissues of the animal at slaughter.

Hormones may be used to promote efficient growth. Estradiol, progesterone, and testosterone (three natural hormones), and zeranol and trenbolone acetate (two synthetic hormones) may be used as an implant on the animal's ear. The hormone is time released, and is effective for 90 to 120 days. In addition, melengesterol acetate, which can be used to suppress estrus, or improve weight gain and feed efficiency, is approved for use as a feed additive. Not all combinations of hormones are approved for use in all classes of cattle. Hormones are approved for specific classes of animals only, and cannot be used in non-approved classes.

How is beef inspected?

Inspection is mandatory; grading is voluntary, and a plant pays to have its meat graded. USDA-graded beef sold at the retail level is Prime, Choice, and Select. Lower grades (Standard, Commercial, Utility, Cutter, and Canner) are mainly ground or used in processed meat products. Retail stores may use other terms which must be different from USDA grades.

USDA Prime beef (about two percent of graded beef) has more marbling, so it is the most tender and flavorful. However, it is higher in fat content. Most of the graded beef sold in supermarkets

is USDA Choice or USDA Select. The protein, vitamin, and mineral content of beef are similar regardless of the grade.

What is the “USDA Certified Tender” and “USDA Certified Very Tender” Program?

USDA Certified Tender Shield In connection with the USDA Beef Carcass Quality Grading Program under the Agricultural Marketing Service (AMS) and grades such as USDA Prime, Choice and Select, this program provides retailers with a new tool to help their customers identify what specific cuts of beef are consistently tender or very tender.

Companies wishing to use this designation must meet the International tenderness standard and be reviewed by AMS' Grading and Verification Division prior to final use by the approved program. Once the program has been approved, USDA's Food Safety and Inspection Service (FSIS), Office of Policy and Program Development (OPPD), Labeling and Program Delivery Division (LPDD) must also approve label claims for “USDA Tender” or “USDA Very Tender”. For more information, go to <http://www.ams.usda.gov/AMSV1.0/TendernessMarketingClaim>.

How is ungraded beef different?

All beef is inspected for wholesomeness. The overall quality of ungraded beef may be higher or lower than most government grades found in retail markets.

What is marbling?

Marbling is white flecks of fat within the meat muscle. The greater amount of marbling in beef, the higher the grade because marbling makes beef more tender, flavorful, and juicy.

Retail Cuts of Fresh Beef

There are four basic major (primal) cuts into which beef is separated: chuck, loin, rib, and round. It is recommended that packages of fresh beef purchased in the supermarket be labeled with the primal cut as well as the product, such as "chuck roast" or "round steak." This helps consumers know what type of heat is best for cooking the product. Generally, chuck and round are less tender and require moist heat such as braising; loin and rib can be cooked by dry heat methods such as broiling or grilling.

Unfortunately, names for various cuts can vary regionally in stores, causing confusion over the choice of cooking method. For example, a boneless top loin steak is variously called: strip steak, Kansas City Steak, N.Y. strip steak, hotel cut strip steak, ambassador steak, or club sirloin steak.

How much beef is consumed?

Figures from the USDA's Economic Research Service show average annual per capita beef consumption for the following selected periods:

How Much Beef is consumed?

Year	Weight	Year	Weight
1910	48 pounds	1960	59 pounds
1920	41 pounds	1970	80 pounds
1930	34 pounds	1980	72 pounds
1940	38 pounds	1990	64 pounds
1950	45 pounds	2012	54.5 pounds

Nutrition Labeling

Nutrition claims such as "lean" and "extra lean" are sometimes seen on beef products. Here are their definitions:

"Lean" - 100 grams of beef with less than 10 grams of fat, 4.5 grams or less of saturated fat, and less than 95 milligrams of cholesterol.

"Extra Lean" - 100 grams of beef with less than 5 grams of fat, less than 2 grams of saturated fat, and less than 95 milligrams of cholesterol.

What does "natural" mean?

All fresh meat qualifies as "natural." Products labeled "natural" cannot contain any artificial flavor or flavoring, coloring ingredient, chemical preservative, or any other artificial or synthetic ingredient; and the product and its ingredients are not more than minimally processed (ground, for example). All products claiming to be natural should be accompanied by a brief statement which explains what is meant by the term "natural."

Some companies promote their beef as "natural" because they claim their cattle weren't exposed to antibiotics or hormones and were totally raised on a range instead of being "finished" in a feedlot.

How & why is some beef aged?

Beef is aged to develop additional tenderness and flavor. It is done commercially under controlled temperatures and humidity. Since aging can take from 10 days to 6 weeks, USDA does not recommend aging beef in a home refrigerator.

Why beef is called a "red" meat?

Oxygen is delivered to muscles by the red cells in the blood. One of the proteins in meat, myoglobin, holds the oxygen in the muscle. The amount of myoglobin in animal muscles determines the color of meat. Beef is called a "red" meat because it contains more myoglobin than chicken or fish. Other "red" meats are veal, lamb, and pork.

Color of Beef

Beef muscle meat not exposed to oxygen (in vacuum packaging, for example) is a burgundy or purplish color. After exposure to the air for 15 minutes or so, the myoglobin receives oxygen and the meat turns bright, cherry red.

After beef has been refrigerated about 5 days, it may turn brown due to chemical changes in the myoglobin. Beef that has turned brown during extended storage may be spoiled, have an off-odor, and be tacky to the touch.

Iridescent Color of Roast Beef

Sliced cooked beef or lunch meat can have an iridescent color. Meat contains iron, fat, and many other compounds. When light hits a slice of meat, it splits into colors like a rainbow. There are also various pigments in meat compounds which can give it an iridescent or greenish cast when exposed to heat and processing. Iridescent beef isn't spoiled necessarily. Spoiled cooked beef would probably also be slimy or sticky and have an off-odor.

Additives

Additives are not allowed on fresh beef. If beef is processed, additives such as MSG, salt, or sodium erythorbate must be listed on the label.

Dating of Beef Products

Product dating is not required by Federal regulations. However, many stores and processors may voluntarily date packages of raw beef or processed beef products. If a calendar date is shown, there must be a phrase explaining the meaning of the date.

Use or freeze products with a "Sell-By" date within 3 to 5 days of purchase.

If the manufacturer has determined a "Use-By" date, observe it. This is a quality assurance date after which peak quality begins to lessen but the product may still be used. It's always best to buy a product before its date expires. It's not important if a date expires after freezing beef because all foods stay safe while properly frozen.

What foodborne organisms are associated with beef?

Escherichia coli can colonize in the intestines of animals, which could contaminate muscle meat at slaughter. *E. coli* O157:H7 is a rare strain that produces large quantities of a potent toxin that forms in and causes severe damage to the lining of the intestine. The disease produced by it is called Hemorrhagic Colitis and is characterized by bloody diarrhea. *E. coli* O157:H7 is easily destroyed by thorough cooking.

Salmonella may be found in the intestinal tracts of livestock, poultry, dogs, cats, and other warm-blooded animals. There are about 2,000 *Salmonella* bacterial species. Freezing doesn't kill this microorganism, but it is destroyed by thorough cooking. *Salmonella* must be eaten to cause illness. They cannot enter the body through a skin cut. Cross-contamination can occur if raw meat or its juices contact cooked food or foods that will be eaten raw, such as salad.

Staphylococcus aureus can be carried on human hands, nasal passages, or throats. Most foodborne illness outbreaks are a result of contamination from food handlers and production of a heat-stable toxin in the food. Sanitary food handling and proper cooking and refrigerating should prevent staphylococcal foodborne illness.

Listeria monocytogenes is destroyed by cooking, but a cooked product can be recontaminated by poor handling practices and poor sanitation. FSIS has a zero tolerance for *Listeria monocytogenes* in cooked and ready-to-eat products such as beef franks or lunchmeat. Observe handling information such as "Keep Refrigerated" and "Use-By" dates on labels.

Rinsing Beef

It isn't necessary to wash raw beef before cooking it. Any bacteria which might be present on the surface would be destroyed by cooking.

How to Handle Beef Safely

Raw Beef: Select beef just before checking out at the register. Put packages of raw beef in disposable plastic bags, if available, to contain any leakage which could cross-contaminate cooked foods or produce. Beef, a perishable product, is kept cold during store distribution to retard the growth of bacteria.

Take beef home immediately and refrigerate it at 40 °F (4.4 °C); use within 3 to 5 days—1 or 2 days for ground beef and variety meats such as liver, kidneys, tripe, sweetbreads, or tongue—or at freeze at 0 °F (-17.8 °C). If kept frozen continuously, it will be safe indefinitely.

It is safe to freeze beef in its original packaging or repackage it. However, for long-term freezing, overwrap the porous store plastic with aluminum foil, freezer paper, or freezer-weight plastic wrap or bags to prevent "freezer burn," which appears as grayish-brown leathery spots and is caused by air reaching the surface of food. Cut freezer-burned portions away either before or after cooking the beef. Heavily freezer-burned products may have to be discarded for quality reasons. For best quality, use steaks and roasts within 9 to 12 months.

Ready-Prepared Beef: For fully-cooked, take-out beef dishes such as Chinese food, barbecued ribs, or fast food hamburgers, be sure they are hot at pickup. Use cooked beef within 2 hours—1 hour if the air temperature is above 90 °F (32.2 °C) or refrigerate it at 40 °F (4.4 °C) in shallow, covered containers. Eat within 3 to 4 days, either cold or reheated to 165 °F (73.9 °C)—hot and steaming. It is safe to freeze ready-prepared beef dishes. For best quality, use within 4 months.

Safe Defrosting

There are three safe ways to defrost beef: in the refrigerator, in cold water, and in the microwave. Never defrost on the counter or in other locations.

Refrigerator: It's best to plan ahead for slow, safe thawing in the refrigerator. Ground beef, stew meat, and steaks may defrost within a day. Bone-in parts and whole roasts may take 2 days or longer. Once the raw beef defrosts, it will be safe in the refrigerator for 3 to 5 days before cooking. During this time, if you decide not to use the beef, you can safely refreeze it without cooking it first.

Cold Water: To defrost beef in cold water, do not remove packaging. Be sure the package is airtight or put it into a leak-proof bag. Submerge the beef in cold water, changing the water every 30 minutes so that it continues to thaw. Small packages of beef may defrost in an hour or less; a 3- to 4-pound roast may take 2 to 3 hours.

Microwave: When microwave defrosting beef, plan to cook it immediately after thawing because some areas of the food may become warm and begin to cook during microwaving. Holding partially-cooked food is not recommended because any bacteria present wouldn't have been destroyed.

Foods defrosted in the microwave or by the cold water method should be cooked before refreezing because they may have been held at temperatures above 40 °F (4.4 °C).

It is safe to cook frozen beef in the oven, on the stove, or grill without defrosting it first; the cooking time may be about 50% longer. Do not cook frozen beef in a slow cooker.

Marinating

Marinate beef in the refrigerator up to 5 days. Boil used marinade before brushing on cooked beef. Discard any uncooked leftover marinade.

Partial Cooking

Never brown or partially cook beef to refrigerate and finish cooking later because any bacteria present wouldn't have been destroyed. It is safe to partially pre-cook or microwave beef immediately before transferring it to the hot grill to finish cooking.

Liquid in Package

Many people think the red liquid in packaged fresh beef is blood. However, blood is removed from beef during slaughter and only a small amount remains within the muscle tissue. Since beef is about 3/4 water, this natural moisture combined with protein is the source of the liquid in the package.

Safe Cooking

For safety, the USDA recommends cooking hamburgers and ground beef mixtures such as meat loaf to 160 °F (71.1 °C) as measured with a food thermometer. Cook all organ and variety meats (such as heart, kidney, liver and tongue) to 160 °F (71.1 °C).

Cook all raw beef steaks and roasts to a minimum internal temperature of 145 °F (62.8 °C) as measured with a food thermometer before removing meat from the heat source. For safety and

quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures.

For approximate cooking times for use in meal planning, see the following chart compiled from various resources. Times are based on beef at refrigerator temperature—40 °F (4.4 °C). Remember that appliances and outdoor grills can vary in heat. Use a food thermometer to check for safe cooking and doneness of beef.

Approximate Beef Cooking Times °F
325° F (162.8 °C); 425 °F (218.3 °C)

Type of Beef Temperature	Size	Cooking Method	Cooking Time	Internal
Rib Roast, bone in and	4 to 6 lbs.	Roast 325 °F	23-25 min./lb.	145 °F (62.8 °C) rest > 3 minutes
Rib Roast, boneless rolled	4 to 6 lbs.	Roast 325 °F	Add 5-8 min./lb. to times above	
Chuck Roast, Brisket	3 to 4 lbs.	*Braise 325 °F	*Braise 325 °F	
Round or Rump Roast	2 1/2 to 4 lbs.	Roast 325 °F	30-35 min./lb.	
Tenderloin, whole	4 to 6 lbs.	Roast 425 °F	45-60 min. total	
Steaks	3/4" thick	Broil/Grill	4-5 min. per side	
Stew or Shank Cross Cuts	1 to 1 1/2" thick	Cover with liquid;	simmer 2 to 3 hours	
Short Ribs	4" long and 2"	*Braise 325 °F	1 1/2 to 2 1/2 hours	
Hamburger patties, fresh	4 ounces	Grill, broil or fry	3 to 5 min./ side	160°F(71.1 °C)

*Braising is roasting or simmering less-tender meats with a small amount of liquid in a tightly covered pan.

Microwave Directions:

When microwaving unequal size pieces of beef, arrange in dish or on rack so thick parts are toward the outside of dish and thin parts are in the center; cook on medium-high or medium power.

Place a roast in an oven cooking bag or in a covered pot.

Refer to the manufacturer's directions that accompany the microwave oven for suggested cooking times.

Use a meat thermometer to test for doneness in several places to be sure temperatures listed above have been reached.

Storage Times

Since product dates aren't a guide for safe use of a product, how long can the consumer store the food and still use it at top quality? Follow these tips:

- Purchase the product before the date expires.

- Follow handling recommendations on product.
- Keep beef in its package until using.
- It is safe to freeze beef in its original packaging. If freezing longer than 2 months, overwrap these packages with airtight heavy-duty foil, plastic wrap, or freezer paper or place the package inside a plastic bag.
- For storage times, consult the following chart.

Home Storage of Beef Products

If product has a "Use-By" Date, follow that date. If product has a "Sell-By" Date or no date, cook or freeze the product by the times on the following chart.

Storage Times for Beef Products

Product	Refrigerator 40 °F (4.4 °C)	Freezer 0 °F (-17.8 °C)
Fresh beef roast, steaks, chops, or ribs	3 to 5 days	6 to 12 months
Fresh beef liver or variety meats	1 or 2 days	3 to 4 months
Home cooked beef, soups, stews or casseroles	3 to 4 days	2 to 3 months
Store-cooked convenience meals	1 to 2 days	2 to 3 months
Cooked beef gravy or beef broth	1 or 2 days	2 to 3 months
Beef hot dogs or lunch meats, sealed in package	1 to 2 months 2 weeks (or 1 week after a "Use-By" date)	
Beef hot dogs, opened package	7 days	1 to 2 months
Lunch meats, opened package	3 to 5 days	1 to 2 months
TV dinners, frozen casseroles	Keep Frozen	3 to 4 months
Canned beef products in pantry	2 to 5 years in pantry; 3 to 4 days after opening.	After opening, 2 to 3 months
Jerky, commercially vacuum packaged	1 year in pantry Refrigerate 2 to 3 months. Do not freeze	

Last Modified Mar 24, 2015

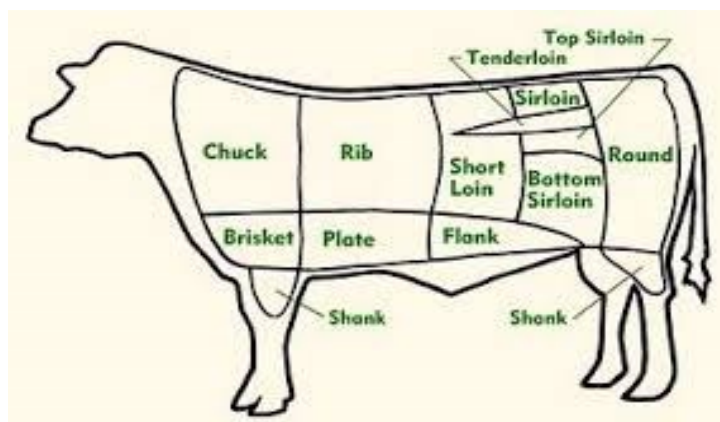
Classroom Preparation Assignment
Topic Five

Beef Identification and Fabrication

Name: _____ **Date:** _____

1. Beef is the meat of domesticated _____, most of which comes from _____.
2. The animal is cut into forequarters and hindquarters. Which primals come from the forequarter? _____ and _____, and _____.
3. The hindquarter has these primals: _____, _____, and _____.
4. Beef offal is divided into muscular and glandular. Which offal is glandular?
5. Which beef offal is muscular?
6. What are the three types of fat in beef?
7. The fat found inside the muscle structure we consume is called _____ fat.
8. If you were to cook the short ribs from the short plate, which cooking method would you use? _____.
9. Which primal does the seven steak come from? _____.
10. Explain the difference between "hamburger" and "ground beef".

Topic Six:
Veal Identification and Fabrication



Veal

Veal is the meat of young, usually male, calves that are by-products of the dairy industry. Dairy cows must calve before they begin to give milk. Calves that are not used in the dairy herds are used in today's veal industry. Although veal may come from any calf under the age of nine months, most comes from calves slaughtered when they are 8 to 16 weeks old. Veal is lighter in color than beef, has a more delicate flavor and is generally tenderer. Young veal has a firm texture, light pink color and very little fat. As soon as a calf starts eating solid food, the iron in the food begins to turn the young animal's meat red. Meat from calves slaughtered when they are older than five months is called a **calf**. It tends to be a deeper red, with some marbling and external fat.

Veal's mild flavor and low fat content makes it a popular meat, especially among those looking for an alternative to beef. Both classic and modern sauces complement its delicate flavor.

PRIMAL AND SUBPRIMAL CUTS OF VEAL

After slaughter, the calf carcass can be split down the backbone into two bilateral halves or, more typically, cut along the natural curvature between the 11th and 12th ribs into a foresaddle (front portion) and a hindsaddle (rear portion). The veal carcass yields five primal cuts: three from the foresaddle (the shoulder, foreshank and breast, and rib), and two from the hindsaddle (the loin and leg). The veal shoulder, rib and loin primals contain both bilateral portions; that is, a veal loin contains both sides of the animal's loin.

As with all meats, it is important to know the location of bones when cutting or working with veal. This makes meat fabrication and carving easier and aids in identifying cuts. A veal carcass weighs in a range of 60 to 245 pounds (27 to 110 kg).

FORESADDLE

Shoulder

Similar to the beef shoulder or chuck, the veal shoulder accounts for 21 percent of the carcass weight. It contains four rib bones (as opposed to five in the beef chuck) and portions of the backbone, blade and arm bones.

The backbone, blade and arm bones are sometimes removed and the meat roasted or stuffed and roasted. Although shoulder chops and steaks can be fabricated, they are inferior to the chops cut from more tender areas such as the loin or rib. Often the shoulder meat is ground or cubed for stew. Because of the relatively large amount of connective tissue it contains, meat from the shoulder is best braised or stewed.

Foreshank and Breast

The foreshank and breast are located beneath the shoulder and rib sections on the front half of the carcass. They are considered one primal cut. Combined, they account for approximately 16 percent of the carcass weight. This primal contains rib bones and rib cartilage, breastbones and shank bones. Because stews such as veal fricassee and veal blanquette, rolled and stuffed, or trimmed and ground.

The foreshank is also very flavorful but tough. It can be braised whole or sliced perpendicular to the shank bone and braised to produce 'Osso bucco'.

Rib

The double rib, also known as a veal hotel rack, is a very tender, relatively small cut accounting for approximately 9 percent of the carcass weight. It is very popular and very expensive. The double rack consists of two racks, each with seven rib bones and a portion of the backbone.

Veal racks can be roasted either whole or split into two sides. Veal racks can be boned out; each side produces a veal rib eye and a small piece of tenderloin known as the short tenderloin, both of which make excellent roasts. More often, veal racks are trimmed and cut into chops, which can also be bone-in or boneless, to be grilled, sautéed or braised.

HINDSADDLE

Loin

The veal loin is posterior to the primal rib, contains two ribs (numbers 12 and 13) and accounts for approximately 10 percent of the carcass weight. The loin consists of the loin eye muscle on top of the rib bones and the tenderloin under them.

The veal loin eye is very tender, and the tenderloin is, without a doubt, the tenderest cut of veal. If the primal veal loin is separated from the primal leg before the tenderloin is removed, the tenderloin will be cut into two pieces. The small portion (short tenderloin) remains in the primal loin, and the large portion (butt tenderloin) remains in the sirloin portion of the primal leg. The tenderloin is sometimes removed and cut into medallions. The veal loin is often cut into chops, bone-in or boneless. It is usually cooked using dry-heat methods such as broiling, grilling, roasting or sautéing.

Leg

The primal veal leg consists of both the sirloin and the leg. Together, they account for approximately 42 percent of the carcass weight. The primal leg is separated from the loin by a

cut perpendicular to the backbone immediately anterior to the hipbone, and it contains portions of the backbone, tailbone, hipbone, aitchbone, round bone and hind shank.

Although it is tender enough to be roasted whole, the veal leg is typically fabricated into cutlets and scallops. To fabricate these cuts, the leg is first broken down into its major muscles: the top round, these muscles can be reduced to scallops by trimming all fat and visible connective tissue and slicing against the grain to the desired thickness. The scallops then should be pounded carefully to tenderize them further and to prevent them from curling when cooked.

The hindshank is somewhat meatier than the foreshank, but both are prepared and cooked in the same manner.

Because the veal carcass is small enough to be handled easily, it is sometimes purchased in forms larger than the primal cuts described earlier. Depending on employee skill, available equipment and storage space and an ability to utilize fully all the cuts and trimmings that fabricating meat produces, a chef may want to purchase veal in one of the following forms:

Foresaddle: The anterior (front) portion of the carcass after it is severed from the hindsaddle by a cut following the natural curvature between the 11th and 12th ribs. It contains the primal shoulder, foreshank and breast, and rib.

Hindsaddle: The posterior portion of the carcass after it is severed from the foresaddle. It contains the primal loin and leg.

Back: The trimmed rib and loin sections in one piece. The back is particularly useful when producing large quantities of veal chops.

Veal side: One bilateral half of the carcass, produced by cutting length wise through the backbone.

Organ Meats

Several calf organ meats are used in food service operations.

Sweetbreads

Sweetbreads are the thymus glands of veal and lamb. As an animal begins to age, its thymus gland shrinks; therefore, sweetbreads are not available from older cattle or sheep. Veal sweetbreads are much more popular than lamb sweetbreads in this country. Good-quality sweetbreads should be plump and firm, with the exterior membrane intact. Delicately flavored and tender, they can be prepared by almost any cooking method.

Calves Liver

Calves' liver is much more popular than beef liver because of its tenderness and mild flavor. Good-quality calves' liver should be firm and moist, with a shiny appearance and without any off-odor. It is most often sliced and sautéed or broiled and served with a sauce.

Kidneys

Kidneys are more popular in other parts of the world than in the United States. Good quality kidneys should be plump, firm and encased in a shiny membrane. Properly prepared kidneys have a rich flavor and firm texture; they are best prepared by moist-heat cooking methods and are sometimes used in stew or kidney pie.

NUTRITION

Like beef, veal is a major source of protein as well as niacin, zinc and B vitamins. Veal has less marbling than beef. When trimmed of any visible fat, veal is lower in fat and calories than comparable beef cuts and is leaner than many cuts of pork and poultry.

Although veal may not be as popular as beef or pork, it is versatile and easy to cook and adds variety to menus. Veal is much more delicately flavored than beef, with a finer texture and lighter color. Its flavor blends well with a variety of sauces and other ingredients without overpowering them. Veal can be cooked by almost any dry-heat, moist-heat or combination cooking method.

Veal quality varies greatly among purveyors. Purchase only from reputable companies to be sure of receiving a consistently high-quality product. Because veal carcasses are relatively small, they are sometimes purchased as primal cuts for further fabrication.



Veal Blanquette en vol au vent- Wikimedia Commons



Wiener schnitzel with potato dumplings- Wikimedia Commons



Veal Osso Bucco- flickr.com



Veal Sweetbreads - Wikimedia Commons

Classroom Preparation Assignment **Topic Six**

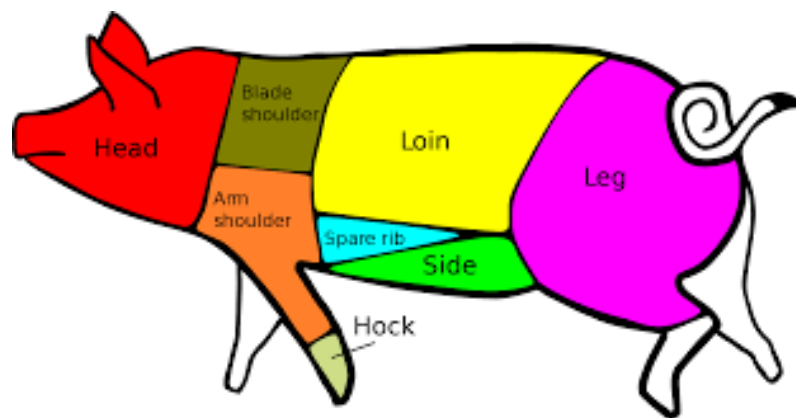
Veal Identification and Fabrication

Name: _____

Date: _____

1. A calf's meat begins to turn from pink to red after the calf _____.
2. Most calves are slaughtered between 8 and 16 weeks but they can be as old as _____.
3. What three primal cuts come from the foresaddle?
4. What two primals come from the hindsaddle?
5. What are the three primary organ meats we utilize from the veal?
6. T or F. Circle one. Veal has more marbling than does beef.
7. What is the best cooking method for Osso Bucco?
8. What is the best cooking method for Weiner Schnitzel?
9. T or F. Circle one. Veal Blanquette is a braised dish.
10. T or F. Circle one. Most calves for veal come from dairies where male cows have no good purpose other than veal.

Topic Seven:
Pork Identification and Fabrication



Pork

Pork is the meat of hogs, usually butchered before they are one year old. With the exception of beef, Americans consume more pork than any other meat. The pork we eat is leaner and healthier than it once was because of advances in animal husbandry.

Because hogs are butchered at a young age, their meat is generally very tender with a delicate flavor. It is well suited to a variety of cooking methods. More than two-thirds of the pork marketed in the United States is cured to produce products such as smoked hams and smoked bacon.

PRIMAL AND SUBPRIMAL CUTS OF PORK

After a hog is slaughtered, it is generally split down the backbone, dividing the carcass into bilateral halves. Like the beef carcass, each side of the hog carcass is then further broken down into the primal cuts: shoulder, Boston butt, belly, loin and fresh ham.

Hogs are bred specifically to produce long loins; the loin contains the highest- quality meat and is the most expensive cut of pork. Pork is unique in that the ribs and loin are considered a single primal. They are not separated into two different primals, as are the ribs and loin of beef, veal and lamb. As with all meats, it is important to know the location of bones when cutting or working with pork. This makes meat fabrication and carving easier and aids in identifying cuts. A hog carcass generally weighs in a range of 120 to 210 pounds (55 to 110 kg).

SHOULDER



Raw pork shoulder- flickr.com



BBQ pork shoulder- Wikimedia.org

The primal shoulder, known as the picnic ham, is the lower portion of the hog's foreleg; it accounts for approximately 20 percent of the carcass weight. The shoulder contains the arm and shank bones and has a relatively high ratio of bone to lean meat.

Because all pork comes from hogs slaughtered at a young age, the shoulder is tender enough to be cooked by any method. It is, however, one of the least tender cuts of pork. It is available smoked or fresh. The shoulder is fairly inexpensive and, when purchased fresh, it can be cut into

shoulder butt steaks or boned and cut into smaller pieces for sautéing or stewing. Whole pork shoulder is the cut preferred by many barbecue pit masters throughout the American South.

The foreshank is called the shoulder hock and is usually smoked. Shoulder hocks are often simmered for long periods in soups, stews and braised dishes to add flavor and richness.

BOSTON BUTT

The primal Boston butt is a square cut located just above the primal pork shoulder. It accounts for approximately 7 percent of the carcass weight.



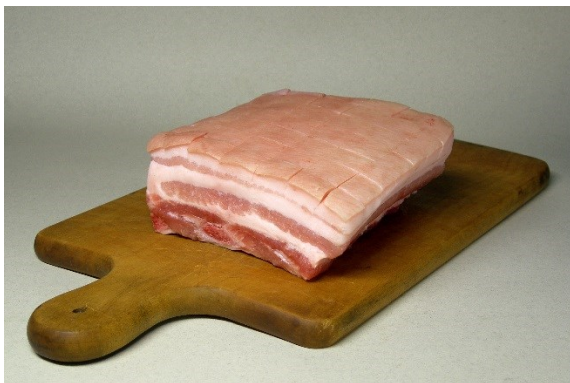
Raw Boston Butt roast- Flickr.com



Smoked Boston Butt- flickr.com

The Boston butt is very meaty and tender, with a good percentage of fat to lean meat. Containing only a small portion of the blade bone, the Boston butt is a good choice when a recipe calls for a solid piece of lean pork. The fresh Boston butt is sometimes cut into steaks, or chops to be broiled or sautéed. When the Boston butt is smoked, it is usually boneless and called a cottage ham.

BELLY



Raw pork belly- Wikimedia commons



Braised pork belly- Wikimedia commons

The primal pork belly is located below the loin. Accounting for approximately 16 percent of the carcass weight, it is very fatty with only streaks of lean meat. It contains the **spareribs**, which are always separated from the rest of the belly before cooking. Spareribs usually are sold fresh but can also be smoked. Typically, they are simmered, and then grilled, or baked, while being basted with a spicy barbecue sauce. The remainder of the pork belly is nearly always cured and smoked to produce **bacon**.



Maple bacon- photo credit Chef Marshall Welsh CEC

LOIN



Pork cuts from loin- photo credit Chef Marshall Welsh CEC

Above from far left and counter clockwise to center: Bone-in pork loin partially frenched, pork trim, fat trim, pork tenderloin (center), plate or back fat (lower center to right).

The loin is cut from directly behind the Boston butt and includes the entire rib section as well as the loin and a portion of the sirloin area. The primal loin accounts for approximately 20 percent of the carcass weight. It contains a portion of the blade bone on the shoulder end, a portion of the hipbone on the ham end, all the ribs and most of the backbone.



Stuffed Roll of Pork loin- photo credit Chef Marshall Welsh CEC

The primal pork loin is the only primal cut of pork not typically smoked or cured. Most of the loin is a single, very tender eye muscle. It is quite lean but contains enough intramuscular and subcutaneous fat to make it an excellent choice for a moist-heat cooking method such as braising, or it can be prepared with dry-heat cooking methods such as roasting or sautéing. The loin also contains the **pork tenderloin**, located on the inside of the rib bones on the sirloin end of the loin. The tenderloin is the tenderest cut of pork; it is very versatile and can be trimmed, cut into medallions and sautéed, or the whole tenderloin can be roasted or braised. The most popular cut from the loin is the pork chop. Chops can be cut from the entire loin, the choicest being center-cut chops from the primal loin after the blade bone and sirloin portions at the front and rear of the loin are removed. The pork loin can be purchased boneless or boned and tied as a roast. A boneless pork loin is smoked to produce **Canadian bacon**. The rib bones, when trimmed from the loin, can be served as **barbecued pork back ribs**.



Canadian Bacon- Chef Marshall Welsh CEC



Barbecued pork ribs- Chef Marshall Welsh CEC

Although not actually part of the primal loin, fatback is the thick layer of fat - sometimes more than an inch (2.5 centimeters) thick - between the skin and the lean eye muscle. It has a variety of uses in the kitchen, especially in the preparation of charcuterie items.

FRESH HAM



*Fresh pork cuts from right to left: Ham, Boston Butt, and Picnic Shoulder
Photo credit: Chef Marshall Welsh CEC*

The primal fresh ham is the hog's hind leg. It is a rather large cut accounting approximately 24 percent of the carcass weight. The ham contains the aitch, and hind shank bones. **Fresh ham**, like

the legs of other meat animals, contains large muscles with relatively small amounts of connective tissue. Like many other cuts of pork, hams are often cured and smoked. However, fresh hams also produce great roasts and can be prepared using almost any cooking method. When cured and smoked, hams are available in a variety of styles; they can be purchased bone-in, shankless or boneless, partially or fully cooked. Fully cooked hams are also available canned. There is a specific ham for nearly every use and desired degree of convenience. The shank portion of the ham is called the **ham hock**. It is used in the same manner as the shoulder hock.

NUTRITION

Like other meats, pork is a good source of protein, B vitamins and other essential nutrients, but it is also high in fat, especially saturated fats. Through new breeding and feeding techniques, the fat content of pork has been lowered in recent years. Cuts from the loin, such as the tenderloin and boneless loin chops, are among the leaner cuts of meat available with reduced levels of saturated fat. Sodium content of smoked and preserved pork products such as bacon, ham and sausage used in charcuterie is high but reduced - sodium preserved and smoked products are increasingly available.

Butchering Procedures

Other than suckling pigs (which are very young, very small whole pigs used for roasting or barbecuing whole), pork products generally are not purchased in forms larger than the primal cuts described earlier. Chefs should master a few important pork fabrication and butchering techniques, however.

~ Procedure for Boning a Pork Loin ~

1. Starting on the sirloin end of a full pork loin, remove the tenderloin in one piece by making smooth cuts against the inside of the rib bones. Pull gently on the tenderloin as you cut.
2. Turn the loin over and cut between the ribs and the eye meat. Continue separating the meat from the bones, following the contours of the bones, until the loin is completely separated from the bones.
3. Trim around the blade bone on the shoulder end of the loin and remove it.

~ Procedure for Tying a Boneless Pork Roast – Half-Stich Method ~

1. Wrap the loose end of the string around the pork loin and tie it with a double knot.
2. Make a loop and slide it down over the roast to approximately 1 inch (2.5 centimeters) from the first knot.

3. Make another loop and slide it.
4. Turn the roast over and cut the string, leaving enough to wrap lengthwise around the roast to the original knot.
5. Wrap the string around the end of the roast, then around the string that formed the last loop. Continue in this fashion for the length of the roast, pulling the string tight after wrapping it around each loop.
6. Turn the roast back over. Wrap the string around the front end of the roast and secure it to the first loop at the point where you tied the first knot.
7. The finished roast. Note the even intervals at which the strings are tied. They should be just snug enough to hold the shape of the roast; they should not dig in or cut the meat.

Pork – Primal to Table

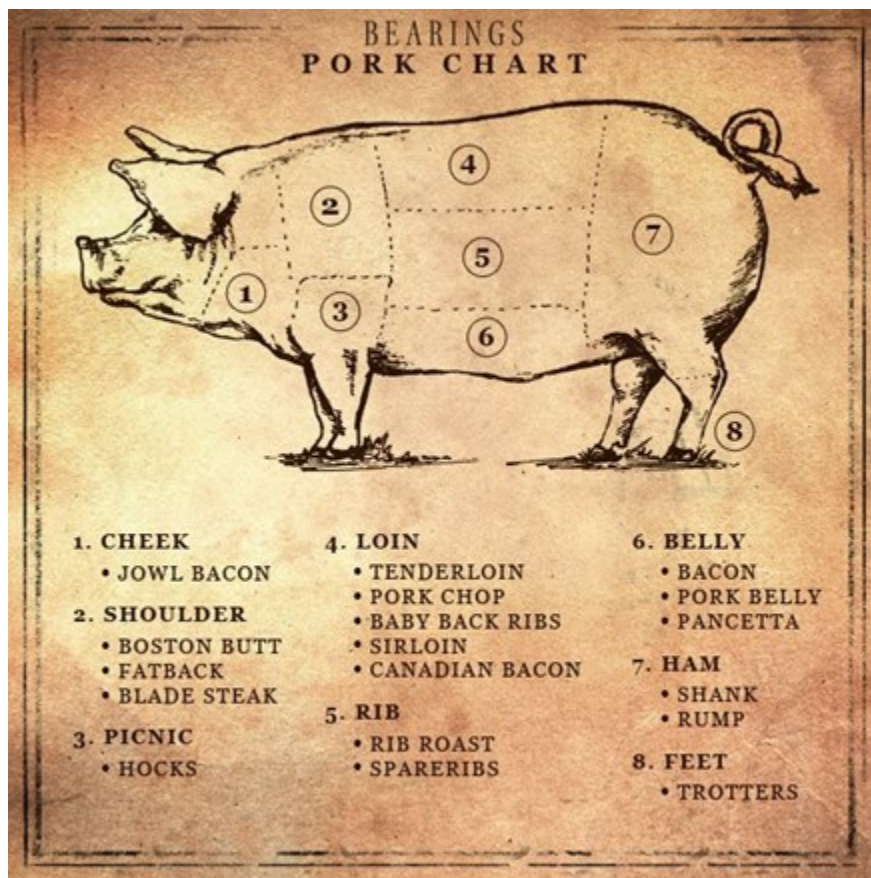
<u>PRIMAL</u>	<u>SUBPRIMAL OR FABRICATED CUT</u>		<u>IMPS COOKING METHODS</u>	<u>SERVING SUGGESTIONS</u>
Shoulder	Picnic shoulder	405	Dry heat (roast or bake)	Smoked picnic shoulder
Boston butt	Boston butt	406	Dry heat (broil or grill; sauté)	Broiled Boston butt steaks
			Moist heat (simmer)	Choucroute
Belly	Bacon	539	Dry heat (saute)	Breakfast meat
			Moist heat (simmer)	Seasoning
			Combination (braise)	Seasoning
	Spareribs	416A	Combination (steam, then grill)	Barbecued spareribs
Loin	Pork loin	410	Dry heat (roast)	Roast pork
			Combination (braise)	Braised pork chops
	Pork tenderloin	415	Dry heat (broil, grill; sauté; roast)	Roast pork tenderloin
	Pork back ribs	422	Combination (steam, then grill)	Barbecued back ribs
	Pork loin chops	1410	Dry heat (broil or grill)	Broiled loin chop with mushroom sauce
			Combination (braise)	Braised loin chop with leeks and fennel
Fresh ham	Fresh ham	401A	Dry heat (roast)	Roast pork with apricots and almonds

~ Procedure for Cutting a Center-cut Pork Chop ~

A center-cut pork chop can be cut from the center portion of a bone-in pork loin without the aid of a saw by using a boning knife and a heavy cleaver. Trim the excess fat from the loin, leaving a 1/4-inch (6-millimeter) layer to protect the meat during cooking.

1. Cut through the meat with the knife.

2. Use the cleaver to chop through the chine bone.
3. To produce a cleaner chop, trim the meat from the end of the rib bone. Then, with the boning knife, separate the loin meat from the chine bones and separate the chine bone from the rib with the cleaver.



Fresh Pork from Farm to Table

Source: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/meat-preparation/fresh-pork-from-farm-to-table/ct_index

Although pork is the number one meat consumed in the world, U.S. consumption dropped during the 1970s, largely because pork's high fat content caused health-conscious Americans to choose leaner meats. Today's hogs have much less fat due to improved genetics, breeding and feeding. Read on for more information about this red meat.

What is pork? Pork is the meat from hogs, or domestic swine. The domestication of "pigs" (immature hogs) for food dates back to about 7000 B.C. in the Middle East. However, evidence shows that Stone Age man ate wild boar, the hog's ancestor, and the earliest surviving pork recipe is Chinese, at least 2000 years old.

Hogs were brought to Florida by Hernando De Soto in 1525, and soon was America's most popular meat. In the 19th century — as America urbanized and people began living away from the farm, "salt pork" — pork that is prepared with a high level of salt to preserve it — became the staple food. Pork has continued to be an important part of our diet since that time.

Pork is generally produced from young animals (6 to 7 months old) that weigh from 175 to 240 pounds. Much of a hog is cured and made into ham, bacon and sausage. Uncured meat is called "fresh pork."

Can antibiotics and hormones be used in pork raising? Antibiotics may be given to prevent or treat disease in hogs. A "withdrawal" period is required from the time antibiotics are administered until it is legal to slaughter the animal. This is so residues can exit the animal's system and won't be in the meat.

FSIS randomly samples pork at slaughter and tests for residues. Data from this monitoring program have shown a very low percentage of residue violations.

No hormones are used in the raising of hogs.

How is pork inspected? All pork found in retail stores is either USDA inspected for wholesomeness or inspected by state systems which have standards equal to the federal government. Each animal and its internal organs are inspected for signs of disease. The "Passed and Inspected by USDA" seal insures the pork is wholesome and free from disease.

Is pork graded? Although inspection is mandatory, its grading for quality is voluntary, and a plant pays to have its pork graded. USDA grades for pork reflect only two levels: "Acceptable" grade and "Utility" grade. Pork sold as Acceptable quality pork is the only fresh pork sold in supermarkets. It should have a high proportion of lean meat to fat and bone. Pork graded as Utility is mainly used in processed products and is not available in supermarkets for consumers to purchase.

What to Look for When Buying Pork. When buying pork, look for cuts with a relatively small amount of fat over the outside and with meat that is firm and a grayish pink color. For best flavor and tenderness, meat should have a small amount of marbling.

Retail Cuts of Fresh Pork. There are four basic (primal) cuts into which pork is separated: shoulder, loin, side and leg.

Shoulder

1. Shoulder Butt, Roast or Steak
2. Blade Steak

3. Boneless Blade Boston Roast
4. Smoked Arm Picnic
5. Smoked Hock
6. Ground Pork for Sausage
- 7.

Side

1. Spare Ribs/Back Ribs
2. Bacon
- 3.

Loin

1. Boneless Whole Loin (Butterfly Chop)
2. Loin Roast
3. Tenderloin
4. Sirloin Roast
5. Country Style Ribs
6. Chops

Leg

1. Ham/Fresh or Smoked and Cured

How much pork is consumed in America?

Figures from the USDA's Economic Research Service show **average annual per capita** pork consumption for the following selected periods:

- 1970: 48 pounds
- 1975: 39 pounds
- 1980: 52 pounds
- 1985: 48 pounds
- 1990: 46 pounds
- 1995: 48 pounds
- 2000: 47 pounds
- 2005: 46.6 pounds
- 2009: 49.6 pounds

What does "natural" mean? All fresh meat qualifies as "natural." Products labeled "natural" cannot contain any artificial flavor or flavoring, coloring ingredient, chemical preservative or any other artificial or synthetic ingredient; and the product and its ingredients are not more than minimally processed (ground, for example). All products claiming to be natural should be accompanied by a brief statement which explains what is meant by the term "natural."

Why is pork a "red" meat? Oxygen is delivered to muscles by the red cells in the blood. One of the proteins in meat, myoglobin, holds the oxygen in the muscle. The amount of myoglobin in animal muscles determines the color of meat. Pork is classified a "red" meat because it contains more myoglobin than chicken or fish. When fresh pork is cooked, it becomes lighter in color, but it is still a red meat. Pork is classed as "livestock" along with veal, lamb and beef. All livestock are considered "red meat."

Dating of Pork. Product dating (i.e. applying "sell by" or "use by" dates) is not required by Federal regulations. However, many stores and processors may voluntarily choose to date packages of raw pork. Use or freeze products with a "sell-by" date within 3 to 5 days of *purchase*. If the manufacturer has determined a "use-by" date, observe it. It's always best to buy a product before its date expires. *It's not important if a date expires after freezing pork because all foods stay safe while properly frozen.*

What foodborne organisms are associated with pork? Pork must be adequately cooked to eliminate disease-causing parasites and bacteria that may be present. Humans may contract trichinosis (caused by the parasite, *Trichinella spiralis*) by eating undercooked pork. Much progress has been made in reducing trichinosis in grain-fed hogs and human cases have greatly declined since 1950. Today's pork can be safely enjoyed when cooked to an internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures.

Some other foodborne micro-organisms that can be found in pork, as well as other meats and poultry, are *Escherichia coli*, *Salmonella*, *Staphylococcus aureus*, *Yersinia enterocolitica* and *Listeria monocytogenes*. People can become infected with these bacteria by consuming raw or undercooked pork, or from the cross-contamination of food contact surfaces, such as countertops, cutting boards, utensils. These bacteria are all destroyed by proper handling and thorough cooking.

Chitterlings (made of large intestine of swine) can be contaminated with the bacteria *Yersinia enterocolitica*, which can cause a diarrheal illness called "yersiniosis."

For more information, see our fact sheet:

[Yersiniosis and Chitterlings: Tips to Protect You and Those You Care for from Foodborne Illness.](#)

Rinsing Pork. It isn't necessary to wash raw pork before cooking it. Any bacteria which might be present on the surface would be destroyed by cooking.

How to Handle Pork Safely

Raw Pork. Select pork just before checking out at the supermarket register. Put packages of raw pork in disposable plastic bags (if available) to contain any leakage which could cross contaminate cooked and ready-to-eat foods or produce. Take pork home immediately and refrigerate it at 40 °F; use within 3 to 5 days or freeze (0 °F).

Ready-Prepared Pork. For fully cooked take-out pork dishes such as Chinese food or barbecued ribs, be sure they are hot at pick-up. Use cooked pork within two hours (one hour if air temperature is above 90 °F) or refrigerate it at 40 °F or less in shallow, covered containers. Eat within 3 to 4 days, either cold or reheated to 165 °F (hot and steaming). It is safe to freeze ready prepared pork dishes. For best quality, use within 3 months.

Safe Thawing

There are three safe ways to thaw pork: in the refrigerator, in cold water (in an airtight or leak-proof bag) and in the microwave. Never thaw at room temperature on the counter or in other locations.

It's best to plan ahead for slow, safe thawing in the refrigerator. After thawing raw pork by this method, it will remain safe in the refrigerator 3 to 5 days before cooking. During this time, if you decide not to use the pork, *you can safely refreeze it without cooking it first.*

When microwave-defrosting pork, plan to cook it immediately after thawing because some areas of the food may become warm and begin to cook during microwaving. Holding partially cooked food is not recommended because any bacteria present wouldn't have been destroyed. *Foods defrosted in the microwave or by the cold water method should be cooked before refreezing because they potentially may have been held at temperatures above 40 °F.*

It is safe to cook frozen pork in the oven, on the stove or grill without defrosting it first; the cooking time may be about 50% longer. Use a meat thermometer to check for doneness. Do not cook frozen pork in a slow cooker.

Marinating

Marinate pork in the refrigerator in a covered container up to 5 days. Boil used marinade before brushing on cooked pork. Discard any uncooked leftover marinade.

Irradiation

Irradiation has been approved for use on pork by FDA and USDA/FSIS in low-doses (to control trichina). Treated pork would not be sterile and would still need to be handled

safely. *Trichinella* could be alive but would be unable to reproduce. Packages of irradiated pork must be labeled with the irradiation logo as well as the words "Treated with Irradiation" or "Treated by Irradiation" so they would be easily recognizable at the store.

Partial cooking

Never brown or partially cook pork, then refrigerate and finish cooking later, because any bacteria present wouldn't have been destroyed. It is safe to partially pre-cook or microwave pork *immediately* before transferring it to the hot grill to finish cooking.

Safe cooking

For safety, the USDA recommends cooking ground pork patties and ground pork mixtures such as meat loaf to 160 °F. Cook all organ and variety meats (such as heart, kidney, liver, tongue, and chitterlings) to 160 °F. Cook all raw pork steaks, chops, and roasts to a minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures.

For approximate cooking times for use in meal planning, see the attached chart compiled from various resources. Times are based on pork at refrigerator temperature (40 °F). Remember that appliances and outdoor grills can vary in heat. Use a meat thermometer to check for safe cooking and doneness of pork.

Can Safely Cooked Pork Be Pink?

Cooked muscle meats can be pink even when the meat has reached a safe internal temperature. If fresh pork has reached 145 °F throughout, even though it may still be pink in the center, it should be safe. The pink color can be due to the cooking method or added ingredients.

Microwave Directions

- When microwaving unequal size pieces of pork, arrange in dish or on rack so thick parts are toward the outside of dish and thin parts are in the center, and cook on medium-high or medium power.
- Place a roast in an oven cooking bag or in a covered pot.
- Refer to the manufacturer's directions that accompany the microwave oven for suggested cooking times.
- Test with a food thermometer in several places to be sure temperatures listed above have been reached.

FRESH PORK: Safe Cooking Chart

Cook all raw pork steaks, chops, and roasts to a minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures.

Fresh Pork: Safe Cooking Chart			
Cut	Thickness or Weight	Cooking Time	Minimum Internal Temperature & Rest Time
ROASTING: Set oven at 350 °F. Roast in a shallow pan, uncovered.			
Loin Roast, Bone-in or Boneless	2 to 5 pounds	20 min. per pound	145 °F and allow to rest for at least 3 minutes
Crown Roast	10 pounds	12 min. per pound	
Leg, (Fresh Ham) Whole, Bone-in	18 to 20 pounds	15 min. per pound	
Leg, (Fresh Ham) Half, Bone-in	5 to 8 pounds	22-25 min. per pound	
Boston Butt	3 to 6 pounds	45 min. per pound	
Tenderloin (Roast at 425-450 °F)	½ to 1½ pounds	Total time: 20 to 27 min.	
Ribs (Back, Country-style or Spareribs)	2 to 4 pounds	1½ to 2 hours (or until fork tender)	
BROILING (4 inches from heat; turn once) or GRILLING (over direct, medium heat; turn once halfway through grilling)			
Loin Chops, Bone-in or Boneless	¾-inch or 1½ inches	Total time: 8-9 or 12-16 min.	145 °F and allow to rest for at least 3 minutes

Loin Kabobs	1-inch cubes	Total time: 10-15 min.	
Tenderloin	½ to 1½ pounds	Total time: 20 min.	
Ribs (indirect heat), all types	2 to 4 pounds	1½ to 2 hours	
Ground Pork Patties (direct heat)	½ inch	Total time: 8-10 min.	160 °F
IN SKILLET ON STOVE			
Loin Chops or Cutlets	¼-inch or ¾-inch	Total time: 3-4 or 7-8 min.	145 °F and allow to rest for at least 3 minutes
Tenderloin Medallions	¼ to ½-inch	Total time: 4 to 8 min.	
Ground Pork Patties	½ inch	Total time: 8 to 10 min.	160 °F
BRAISING: Cover and simmer with a liquid.			
Loin Chops, Bone-in or Boneless	¼ to ¾-inch	Total time: 6-8 min.	145 °F and allow to rest for at least 3 minutes
Loin Cubes and Tenderloin Medallions	½ to 1 inch	Total time: 8-10 min.	
Shoulder Butt, Boneless	3 to 6 pounds	2 to 2½ hours	
Ribs, all types	2 to 4 pounds	1½ to 2 hours	
STEWING: Cover pan; simmer, covered with liquid.			
Loin or Shoulder Cubes	1 inch	45 to 60 min. or until tender	145 °F and allow to rest for at least 3 minutes
NOTE: Approximate cooking times were compiled from various resources.			

HOME STORAGE OF FRESH PORK

These short, but safe, storage time limits will help keep refrigerated food from spoiling or becoming dangerous to eat. Because freezing keeps food safe indefinitely, recommended storage times are for quality only.

Product	Refrigerator 40 °F	Freezer 0 °F
Fresh pork roast, steaks, chops or ribs	3 to 5 days	4 to 6 months
Fresh pork liver or variety meats	1 to 2 days	3 to 4 months
Home cooked pork; soups, stews or casseroles	3 to 4 days	2 to 3 months
Store-cooked convenience meals	1 to 2 days	2 to 3 months
Frozen Dinners & Entrees	Keep frozen before cooking	3 to 4 months
Canned pork products in pantry	2 to 5 years in pantry; 3 to 4 days after opening	After opening, 2 to 3 months

Last Modified Aug 06, 2013

Classroom Preparation Assignment
Topic Seven

Pork Identification and Fabrication

Name: _____

Date: _____

1. Pork is the meat of hogs, usually butchered **before** _____.
2. Aside from _____, Americans consume more pork than any other meat.
3. Name the five primal cuts found on each side of the hog.
4. A market ready carcass of a hogs weights between _____ and _____ pounds.
5. Another name for the primal shoulder of the hog is the _____.
6. The hock from the shoulder is often smoked as a seasoning meat for _____, _____ and _____ dishes.
7. If smoking a pork primal which of these two would be the best choice and why? Picnic or Boston Butt?
8. What cut is often separated from the pork belly?
9. What is the most prized and tenderest part of the hog? It is found "inside" the animal near the loin.
10. Who grades pork and what are the two grades?

Topic Eight

Midterm Examination and Chicken Fabrication Practical

Today in lab you will be tested on all material covered thus far in the course.

Questions may come from:

- 1. Classroom Preparation Assignments,**
- 2. Power, points,**
- 3. the textbook- Garde Manger- a Course Guide to the Cold Kitchen, and**
- 4. lecture notes.**

You will also be given 20 minutes to completely fabricate a chicken into the following cuts:

- two airline breasts
- two wing lollipops
- one drumstick
- one thigh with oyster meat
- one leg quarter with oyster meat
- one clean carcass, wishbone and trim suitable for stock

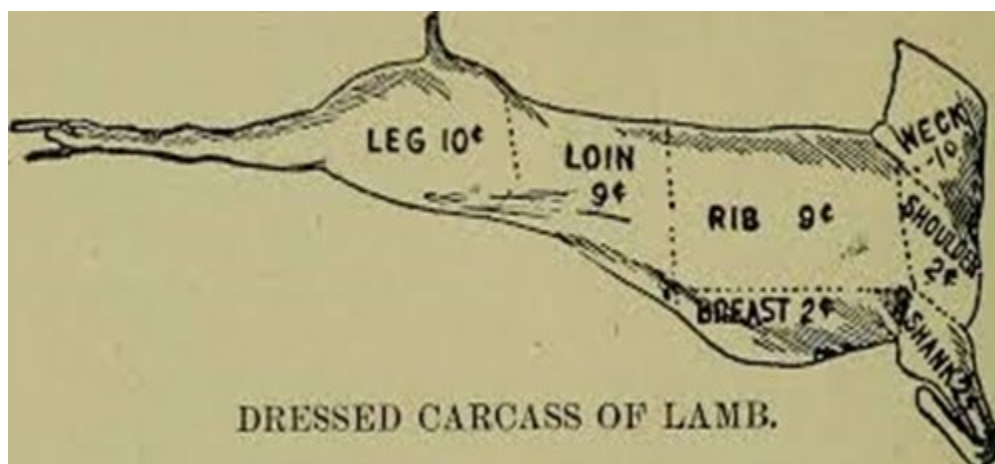
You will present your fabricated chicken with carcass on a lined half sheet pan for grading by the instructor.

After the fabrication practical the class will perform kitchen sanitation as usual with a special emphasis on midterm deep cleaning as listed by the chef instructor.

In preparation for the midterm exam, it might be a good idea to form study groups to create flash cards for practice remembering specific material covered in all of the above sources listed on the top of the page.

Best wishes for great preparation and outstanding performance at this milepost in the course.

Topic Nine:
Lamb Identification and Fabrication



Dressed carcass of lamb- Flickr.com



Spring Lamb- Wikipedia.org

Lamb is the meat of sheep slaughtered when they are less than one year old. Meat from sheep slaughtered after that age is called **mutton**. Spring lamb is young lamb that has not been fed grass or grains. Because lamb is slaughtered at an early age, it is quite tender and can be prepared by almost any cooking method. Lamb has a strong and distinctive flavor. It goes well with boldly flavored sauces and accompaniments.



A sheep older than one year like the sheep above is known as “mutton”.

Sheep- Wikipedia.org

PRIMAL AND SUBPRIMAL CUTS OF LAMB

After the young sheep is slaughtered, it is usually reduced to the primal cuts: shoulder, breast, rack, loin and leg. Like some veal primals, lamb primals are crosscut sections and contain both bilateral halves (for example, the primal leg contains both hind legs). Lamb primals are not classified into a forequarter and hindquarter like beef, or a foresaddle and hindsaddle like veal.

As with all meats, it is important to know the location of bones when cutting or working with lamb. This makes meat fabrication and carving easier and aids in identifying cuts. A lamb carcass generally weighs between 41 and 75 pounds (20 and 35 kg).

SHOULDER

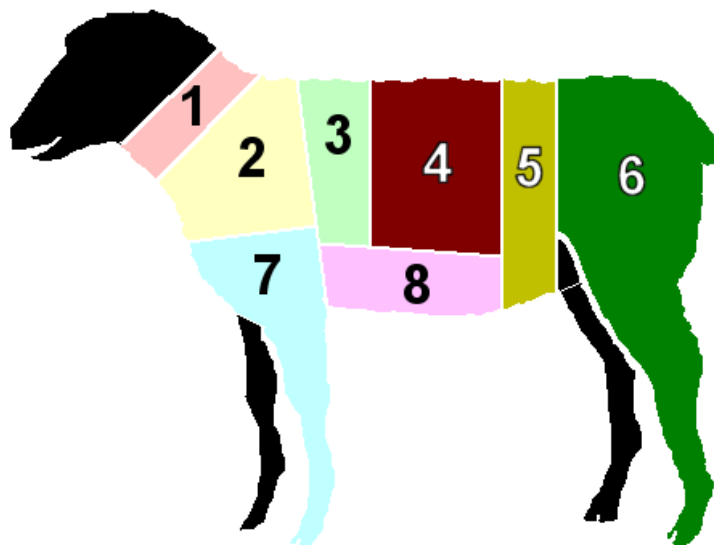


Roasted shoulder of lamb- Flickr.com- notice the shoulder blade on the far left. Lamb and sheep have no articulated joint on their front legs as they do on their back legs.

The primal lamb shoulder is a relatively large cut accounting for 36 percent of the carcass weight. The lamb shoulder contains four rib-bones and the arm, blade and neck bones as well as many small, tough muscles whose grains travel in different directions.

All these bones and muscle groups make it nearly impossible to cook and carve a whole shoulder. Although the shoulder may be cut into chops, boned and then roasted, or braised, with or without stuffing, it is more commonly diced for stew or ground for patties.

BREAST



Lamb chart by Wikimedia commons .org- Section 8 is the breast section of the lamb.

The primal lamb breast contains the breast and foreshank portions of the carcass. Together they account for approximately 17 percent of the carcass weight and contain the rib, breast and shank bones. The primal breast is located beneath the primal rack and contains the rib tips, which are cut off to produce the rack. When separated from the rest of the breast, these small ribs are called 'Denver ribs' and can be substituted for pork ribs when desired.

Although the breast is not used extensively in food service operations, it can be stuffed and braised, either bone-in or boneless. Lamb foreshanks are quite meaty and may be braised and served as an entree, used for broths or ground.

RACK



Lamb rack- Wikimedia



Roasted rack of lamb - Flickr

The primal lamb rack is also known as the **hotel rack**. It is located between the primal shoulder and loin. Containing eight ribs and portions of the backbone, it accounts for approximately 8 percent of the carcass weight.

The rack is valued for its tender rib eye muscle. The hotel rack is usually split racks can then be grilled , broiled or roasted as racks or cut into single or double rib chops before cooking.

LOIN



Lamb loin noisette- Wikimedia commons



Lamb chops (T-bones) – Wikimedia commons

The loin is located between the primal rib and leg. It contains rib number 13 and portions of the backbone as well as the loin eye muscle, tender loin and flank. It accounts for approximately 13 percent of the carcass weight.

Except for the flank, the loin meat is very tender and is invariably cooked using a dry-heat method such as broiling, grilling or roasting. The loin may be boned to produce boneless roasts or chops or cut into chops with the bone in. The loin eye may be removed and cut into medallions or noisette.

LEG



Raw and roasted legs of lamb - Wikimedia commons

The primal leg is a large section accounting for approximately 34 percent of the carcass weight. It is the posterior portion of the carcass, separated from the loin by a straight cut anterior to the hipbone cartilage.

As with veal, the cut of meat that would be the sirloin on a beef carcass is separated from the lamb loin by this cut and becomes part of the primal leg.

The lamb leg contains several bones: the backbone, tail, hip, aitch, round and shank bones. The primal leg is rarely used as is. More often, it is split into two legs, and partially or fully boned. Lamb legs are quite tender - the sirloin end more so than the shank end - and are well suited to a variety of cooking methods. A bone-in leg is often roasted for buffet service or braised with vegetables or beans for a hearty dish. Steaks can also be cut from the bone-in leg, with the sirloin end producing the tenderest cuts. A boneless leg can be tied and roasted, with or without stuffing, or trimmed and cut into scallops. The shank end can be diced for stew or ground for patties.

Because lamb carcasses are so easily handled, purveyors often sell them whole or cut in a variety of ways to better meet their customers' needs. As well as whole-carcass, primal and fabricated cuts, lamb can be purchased in the following forms:

- **Foresaddle:** The anterior (front) portion of the carcass after it is severed from the hindsaddle by a cut following the natural curvature between the 12th and 13th ribs. It contains the primal shoulder, breast, foreshank, and rack.
- **Hindsaddle:** The posterior portion of the carcass after it is severed from the foresaddle. It contains the primal loin and leg together with the kidneys.
- **Back:** The trimmed rack and loin sections in one piece. The back is particularly useful when producing large quantities of lamb chops.
- **Bracelet:** The primal hotel rack with the connecting breast sections.

Nutrition

Lamb, especially when purchased in subprimal cuts to be fabricated on-site, is an economical source of high-quality protein. Lean and lower in cholesterol than other red meat proteins, lamb is a good source of iron as compared with chicken, fish or poultry. Lamb has less marbling than other red meats. Its excess fat appears on the outside of many cuts and can easily be trimmed before cooking. Grass-fed lamb, like meat from other grass-fed ruminants, is high in the powerful antioxidant conjugated linoleic acid, identified as a cancer preventative.

Butchering Procedures

Lamb is unique among the common meat animals in that it is small enough to be handled easily in its carcass form. Thus, food service operations sometimes purchase lamb whole and fabricate the desired cuts themselves. This is practical if the operation has the necessary employee skills, equipment and storage space, as well as a need for all the various cuts and trimmings that butchering a whole carcass produces. A few important lamb fabrication and butchering techniques follow.

Domestic versus Imported Lamb

Technologies that increase shelf life have made imported fresh lamb commonplace. Lamb imported from New Zealand and Australia accounts for nearly 50 percent of the lamb meat sold in the United States. Domestic lamb differs from imported lamb in a few ways. Domestic lamb is primarily grain fed and has a milder flavor than its grass-fed counterparts have. Domestic lamb is raised to approximately 135 pounds, larger than imported lamb, resulting in larger cut sizes.

~Procedure for 'Frenching' a Rack of Lamb~

1. With a meat saw, trim the ribs to approximately 3 inches (7.5 centimeters), measuring from the rib eye on each side of the rack.
2. Turn the rack over and cut down both sides of the featherbones, completely separating the meat from the bone.
3. Turn the rack back over. Using a meat saw, cut between the ribs and the chine bone at a 45-degree angle, exposing the lean meat between the ribs and the vertebral junctures.

Lamb from Farm to Table

Source: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/meat-preparation/focus-on-lambfrom-farm-to-table/ct_index

Sheep is the oldest domesticated meat species. Sheep have been raised by humans beginning about 9,000 years ago in the Middle East. In many countries, lamb (a young sheep) is the major source of protein. Many Americans think of lamb as a springtime food, but it can be enjoyed year round. The following information answers many questions callers have asked the USDA Meat and Poultry Hotline about lamb.

What is the difference between lamb and mutton? Sheep (Ovine) carcasses are classified as lamb, yearling mutton, or mutton depending on their age as evidenced by their muscles and bones. For the purpose of this fact sheet we will be discussing lamb. The flavor of lamb is milder than mutton. Lamb is produced from younger animals, typically less than a year old, and mutton is produced from older animals. Most lambs are brought to market at about 6 to 8 months old. A

lamb weighs about 140 pounds and yields approximately 46 to 49 pounds of edible lean retail lamb cuts, semi-boneless.

If the phrase "Spring Lamb" is on a meat label, it means the lamb was slaughtered between March and October. The term comes from olden times when lambs born in harsh winter weather would have little chance to survive until the next year. Today with more protected animal husbandry conditions, enjoying "lamb" is not confined to a particular season of the year.

How are lambs raised? Lambs are nursed by their mothers and when they are weaned, they gradually begin feeding on pasture or coarsely ground grain. They are fed hay and feed consisting of corn, barley, milo (a type of sorghum), and/or wheat supplemented with vitamins and minerals. Lambs are usually "finished" (grown to maturity) in feedlots where they are fed specially formulated feed. While most lambs are finished on grains, some lambs are raised on pasture and are finished on grass instead of grains. Grass-finished lamb is usually distinguished on the label.

How is lamb inspected? All lamb found in retail stores is either USDA inspected for wholesomeness or inspected by state systems which have standards equal to the Federal government. Each lamb and its internal organs are inspected for signs of disease. The "Passed and Inspected by USDA" seal insures the lamb is wholesome and free from disease.

What does the grade mean? Grading for quality is voluntary. A processing plant may request to have its lamb graded for quality based on traits such as tenderness, juiciness and flavor. USDA-graded lamb sold at the retail level is Prime, Choice, and Good.

****Lower grades (Utility and Cull) are mainly ground or used in processed products.**

Lamb quality grades take into consideration maturity (lamb, yearling mutton, and mutton), conformation, and the palatability-indicating characteristics, such as fat streaking within the flank and firmness of the lean. Most of the graded lamb sold in supermarkets is USDA Choice; 80% of the American lamb supply is USDA Prime or USDA Choice. The protein, vitamin, and mineral content of lamb are similar in all grades.

How is ungraded lamb different? All lamb is inspected for wholesomeness; however, since grading is not mandatory, the overall quality of ungraded lamb is unknown—it may be higher or lower than USDA-graded lamb found at retail. Since the quality of lamb varies according to the age of the animal, it is advisable to buy lamb that has been USDA graded since age is taken into consideration.

Can hormones and antibiotics be used in lamb raising? Yes. Hormones and antibiotics approved by the U.S. Food and Drug Administration (FDA) are permitted to be used in lambs

slaughtered for meat. Antibiotics may be given to prevent or treat disease in lambs and hormones may be given to promote efficient growth. A recommended withholding period is required from the time antibiotics are administered until it is legal to slaughter the animal. This is so drug residues can exit the animal's system. FSIS samples lamb carcasses at slaughter and tests for residues. FSIS laboratory results above the tolerance limit set by FDA is considered a residue violation and are investigated by FDA or the State.

What to Look for When Selecting Lamb. When shopping for lamb, look for meat that is fine textured and firm that has red coloring and white marbling (white flecks of fat within the meat muscle). The fat trim should be firm, white, and not too thick. The USDA quality grades are reliable guides.

Retail Cuts of Fresh Lamb. There are five basic major (primal) cuts into which the lamb carcass is separated: shoulder, rack, shank/breast, loin, and leg. It is recommended that packages of fresh lamb purchased in the supermarket be labeled with the primal cut as well as the product, such as "shoulder roast" or "loin chop."

What is a rack of lamb? The "rack" is the primal cut, more commonly known as the rib. The rack contains 9 full ribs and can be split (along the back bone) into two lamb rib roasts. A "lamb crown roast" is made by sewing two rib roasts together to form a circle or crown.

What is a lamb chop? Chops can come from various primal cuts. "Loin" chops come from the loin and "rib" chops come from the rack (or rib); these are the most tender and most expensive chops. "Blade" and "arm" chops (from the shoulder) and "sirloin" chops (from the leg) are less expensive but may be just as tender.

How much lamb is consumed? According to USDA's Economic Research Service, each American eats about .7 pound of lamb yearly.

What does "natural" mean? All fresh meat qualifies as "natural." Products labeled "natural" cannot contain any artificial flavor or flavoring, coloring ingredient, chemical preservative, or any other artificial or synthetic ingredient; and the product and its ingredients are not more than minimally processed (ground, for example). All products claiming to be natural should be accompanied by a brief statement which explains what is meant by the term "natural."

How and why is some lamb aged? Lamb is aged to develop additional tenderness and flavor. Usually only the higher quality, more expensive primals, such as racks, ribs, and loins are aged, and these are mainly sold to restaurants. Aging is done commercially under controlled temperatures and humidity. Since aging can take from 10 days to 6 weeks under controlled conditions, the USDA does not recommend aging lamb in a home refrigerator.

Why lamb is called a "red" meat? Oxygen is delivered to muscles by the red cells in the blood. One of the proteins in meat, myoglobin, holds the oxygen in the muscle. The amount of myoglobin in animal muscles determines the color of meat. Lamb is called a "red" meat because it contains more myoglobin than chicken or fish. Other "red" meats are beef, veal, and pork.

Additives. Additives are not allowed on fresh lamb. If it is processed, additives such as MSG, salt, or sodium erythorbate must be listed on the label.

Dating of lamb products. Product dating is not required by Federal regulations. However, many stores and processors may voluntarily date packages of raw lamb or processed lamb products. If a calendar date is shown, immediately adjacent to the date must be a phrase explaining the meaning of that date such as "sell-by" or "use before."

Except for "use-by" dates, product dates don't always refer to home storage and use after purchase. "Use-by" dates usually refer to best quality and are not safety dates. But even if the date expires during home storage, a product should be safe, wholesome and of good quality if handled properly and kept at 40° F or below. If the product has a "use-by date," follow that date. If the product has a "sell-by" date or no date, cook or freeze the product according to the recommendations in the "Storage Times" section of this publication.

Rinsing Lamb. There is no need to rinse raw lamb before cooking because this creates a cross-contamination hazard and is not necessary. Any bacteria which might be present would be destroyed by cooking.

How to Handle Lamb Safely. Raw Lamb. Select lamb just before checking out at the register. Put packages of raw lamb in disposable plastic bags (if available) to contain any leakage which could cross-contaminate cooked foods or produce that will be eaten raw such as salad.

Take the lamb home immediately and refrigerate it at 40 °F or below. Use ground lamb or stew meat within 1 to 2 days; lamb chops, roasts, and steaks within 3 to 5 days or freeze at 0 °F or below. If kept frozen continuously, it will be safe indefinitely.

It is safe to freeze lamb in its original packaging or repackage it. However, for long-term freezing, overwrap the porous store plastic with storage wraps or bags to prevent "freezer burn," which appears as grayish-brown leathery spots and is caused by air reaching the surface of food. Cut freezer-burned portions away either before or after cooking the lamb. Heavily freezer-burned products may have to be discarded for quality reasons. For best quality, use frozen lamb roasts, steaks, and chops within 6 to 9 months; ground lamb, 3 to 4 months.

Ready-Prepared Lamb. For fully-cooked, take-out lamb dishes such as Kabobs, Gyros, or Chinese food, be sure they are hot at pickup. Use cooked lamb within 2 hours (1 hour if the air temperature is above 90 °F) or refrigerate it at 40 °F or below in shallow, covered containers. Eat it within 3 to 4 days, either cold or reheated to 165 °F. It is safe to freeze ready-prepared lamb dishes. For best quality, use within 2 to 3 months.

Safe Thawing. There are three safe ways to thaw lamb: in the refrigerator, in cold water, and in the microwave. It's best to plan ahead for slow, safe thawing in the refrigerator. Ground lamb, stew meat, and steaks may defrost within a day. Bone-in parts and whole roasts may take 2 days or longer.

Once the raw product thaws, it will be safe in the refrigerator before cooking 3 to 5 days (for roasts, steaks, and chops) and 1 to 2 days for ground lamb. During this time, if you decide not to use the lamb, you can safely refreeze it without cooking it first.

To thaw lamb in cold water, do not remove the packaging. Be sure the package is airtight or put it into a leak proof bag. Submerge the lamb in cold water, changing the water every 30 minutes so that it continues to thaw. Small packages of lamb may defrost in an hour or less; a 3- to 4-pound roast may take 2 to 3 hours.

When thawing lamb in cold water or in the microwave, plan to cook it immediately after thawing. Never thaw on the counter or any other location at room temperature. Leaving food out too long at room temperature can cause bacteria (such as *Staphylococcus aureus*, *Salmonella* Enteritis, *Escherichia coli* O157:H7, and *Campylobacter*) to grow to dangerous levels that can cause illness.

Foods defrosted in the microwave or by the cold water method should be cooked before refreezing because they may potentially have been held at temperatures above 40 °F, where bacteria multiply rapidly.

It is safe to cook frozen lamb in the oven, on the stove, or grill without defrosting it first; the cooking time may be about 50% longer. Do not cook frozen lamb in a slow cooker.

Marinating. Marinate lamb roasts, steaks, or chops in the refrigerator up to 5 days. Lamb cubes or stew meat can be marinated up to 2 days. Boil used marinade before brushing on cooked lamb. Discard any uncooked leftover marinade.

Storage Times. Since product dates aren't a guide for safe use of a product, how long can the consumer store the food and still use it at top quality? Follow these tips:

- Purchase the product before the date expires.
- Follow handling recommendations on product.
- Keep lamb in its package until ready to use.
- Refrigerate lamb roasts, steaks, and chops 3 to 5 days (ground lamb or stew meat, 1 to 2 days); and 3 to 4 days after cooking.
- If product has a "use-by" date, follow that date.
- If product has a "sell-by" date or no date, cook or freeze the product by the times recommended above.
- Once a perishable product is frozen, it doesn't matter if the date expires because foods kept frozen continuously are safe indefinitely.
- For best quality, use frozen lamb roasts, steaks, and chops within 6 to 9 months; ground lamb, 3 to 4 months.

Safe Cooking

For safety, the USDA recommends cooking lamb patties and ground lamb mixtures such as meat loaf to a safe minimum internal temperature of 160 °F as measured by a food thermometer. Cook all organ and variety meats (such as heart, kidney, liver and tongue) to 160 °F. Cook all raw lamb steaks, chops, and roasts to a minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures. For approximate cooking times for use in meal planning, see the following chart.

Times are based on lamb held at refrigerator temperature (40 °F). Remember that appliances and outdoor grills can vary in heat. Use a food thermometer to check for safe cooking and doneness of lamb.

Approximate Lamb Cooking Times °F				
Cut of Lamb	Size	Cooking Method	Cooking Time	Minimum Internal Temperature & Rest Time
Lamb Leg, bone in	5 to 7 lbs.	Roast 325°	20 to 25 min./lb.	145 °F and allow to rest for at least 3 minutes
	7 to 9 lbs.	Roast 325°	15 to 20 min./lb.	
Lamb Leg, boneless, rolled	4 to 7 lbs.	Roast 325°	25 to 30	

			min./lb.	
Shoulder Roast or Shank Leg Half	3 to 4 lbs.	Roast 325°	30 to 35 min./lb.	
Cubes, for Kabobs	1 to 1½"	Broil/Grill	8 to 12 minutes	
Ground Lamb Patties	2" thick	Broil/Grill	5 to 8 minutes	160 °F
Chops, Rib, or Loin	1 to 1½" thick	Broil/Grill	7 to 11 minutes	145 °F and allow to rest for at least 3 minutes
Leg Steaks	¾" thick	Broil/Grill 4" from heat	14 to 18 minutes	
Stew Meat, pieces	1 to 1½"	Cover with liquid; simmer	1½ to 2 hours	145 °F and allow to rest for at least 3 minutes
Shanks	¾ to 1 lb.			
Breast, Rolled	1½ to 2 lb.	*Braise 325°	1½ to 2 hours	

*Braising is roasting or simmering less-tender meats with a small amount of liquid in a tightly covered pan.

Microwaving. Refer to the microwave's oven manual for microwaving lamb, and check it with a food thermometer.

Partial Cooking. NEVER brown or partially cook lamb to refrigerate and finish cooking later because any bacteria present wouldn't have been destroyed. It is safe to partially cook or microwave lamb immediately before transferring it to a hot grill or conventional oven to finish cooking.

What is the yield of cooked lamb? After cooking bone-in lamb leg or roast, one pound of raw weight will yield 8 to 9 ounces of edible meat. Ground lamb or boneless cuts will yield about 10.5 ounces of edible meat.

Classroom Preparation Assignment

Topic Nine

Lamb Identification and Fabrication

Name: _____ Date: _____

1. To quality as lamb, the animal must be _____ than a year old.
2. To quality as mutton or sheep the animal must be _____ than a year old.
3. T or F. Circle one. Spring lamb has never eaten grass or grain.
4. American lamb is raised to be _____ than lambs from Australia and New Zealand.
5. Which lamb is milder in flavor? American or New Zealand/Australian?
_____.
6. Which primals make up the % of the carcasses total weight?

Shoulder _____	A. 34%
Breast _____	B. 13%
Rack _____	C. 8%
Loin _____	D. 17%
Leg _____	E. 36%
7. What is the lamb chop?
8. What is the lamb rack?
9. What are the three retail grades of lamb by the USDA?
10. What is the best way to cook a boneless leg of lamb?

Topic 10:
Wild Game Identification and Fabrication

Game from Farm to Table

USDA

Source: https://s3.amazonaws.com/assets.cce.cornell.edu/attachments/19032/Game_from_Farm_to_Table.pdf?1481131140

Venison, antelope, American elk, boar, pheasant, and other game animals are now farm raised in the United States. For an increasing number of restaurants and home diners, game meats are becoming more commonplace.

States require restaurants to only serve game that has been slaughtered and dressed under inspection. This can be accomplished under voluntary USDA FSIS inspection or equivalent foreign inspection. The Hotline receives inquiries about these food animal species. Included here are answers to questions about game animals.

What is game?

Game are wild animals and birds. Farm-raised game are originally wild species of animals and birds that are now being raised domestically for sale under voluntary USDA inspection. The U.S. Food and Drug Administration (FDA) has jurisdiction over imported game. Large native game animals living in America include antelope, buffalo, bear, caribou, deer, elk, moose, reindeer, and wild boar. Elsewhere in the world, even rarer varieties eaten by humans are camel, elephant, kangaroo, wild goats, wild sheep, zebra, and other species.

Small game animals include alligator, rabbit, squirrel, beaver, muskrat, opossum, raccoon, armadillo, porcupine, and other species such as nutria.

Game birds include grouse, guineafowl, partridge, squab (young pigeon), quail, pheasant, ratites (emu, ostrich, and rhea), wild ducks, wild geese, wild turkey, and other species. Rock Cornish hens — thought by many consumers to be game birds — are actually young domesticated chickens.

Ratites and squabs are now under mandatory USDA inspection.

NOTE: Game species raised on farms under appropriate regulations can be sold. Wild game species that can be legally hunted under Federal or State regulatory authority cannot be sold, but can be harvested for personal consumption. If you have questions about the harvest of wild game species, contact your State fish and wildlife agencies, or the U.S. Fish and Wildlife Service for Federal regulations on migratory species.

Background on “Venison” Game Animals

In culinary terms, “venison” can be meat from deer, elk, moose, caribou, antelope, and pronghorn. However, when this meat is offered for sale, the name of the specific animal must be specified on the package label.

Deer live in woodlands all over Europe, Asia, northern Africa and America. There are many deer species of various sizes but all the males grow antlers. The meat is lean and has a gamey flavor that can be made milder if soaked overnight.



Wild Whitetail Deer- Wikipedia

Elk meat tastes like mild (almost sweet) beef, with only a very faint venison flavor. Elk can be substituted equally for venison in most standard venison recipes. Elk are from North America, Europe, and Asia.



Bull Elk- Wikimedia commons

Moose is the largest member of the venison family standing about 6 1/2 feet at the shoulder. It's native from North America. The meat is similar to elk.



Bull Moose- Wikipedia

Other Game Animals

Caribou (reindeer) are slightly larger than white-tailed deer. Both males and females have antlers. The meat is somewhat sweeter than other venison. They live primarily in North America and Siberia.



Caribou- Wikimedia Commons

Antelope are currently farmed in Texas, where black buck and nigari antelope, native to Africa, are allowed to roam on huge preserves. Males are called bucks, bulls, or stags; females, does or cows; and un-weaned young are fawns or calves. Antelope meat is leaner, but similar in taste to that of deer.



Pronghorn Antelope- Wikimedia Commons

Pronghorn (once classified as “antelope”) is the last survivor of a species native to North America, with the largest herd in Wyoming. Pronghorn meat is leaner, but similar in taste, to that of deer.

Bison (buffalo) is native to North America. Once about 60 million in number, bison were hunted almost to extinction by the 1890’s. Currently there are more than 150,000 animals being raised across North America today. Bison is said to have a sweeter, richer flavor than beef.



American Bison- Wikipedia

Musk-ox is a heavy-set, shaggy-coated wild ox that lives in northern North America, the Arctic islands, and Greenland. The meat tastes similar to buffalo.



Musk-ox- Wikimedia commons

Collared Peccary (javelina) is a hoofed animal native to parts of Mexico, South America, and the southwest U.S. A substitute is fresh pork.



Collared Peccary- Wikimedia Commons

Rabbits sold for consumption in the U.S. are not North American cottontails, but are usually either crosses between New Zealand and Belgian varieties, Chinese rabbits, or Scottish hares.



European Hares- Wikipedia

Wild boars, along with feral (wild) hogs, are found in 23 states in the U.S. and are estimated to number over 2 million. Like our domestic swine, these animals are not native to North America, but were originally brought over from other continents. Originally domesticated and then released into the wild, these animals are now hybrids.

While some states have limited hunting seasons, most states consider them a nuisance and encourage hunting them for personal consumption.



Feral Hog- Wikimedia commons

Game Birds - see photos in Topic One about Poultry

The game bird industry in the U.S. raises millions of birds for sale to restaurants and direct to consumers. These include up to 10 million pheasants, 37 million quail (including 12 million Bobwhite), 4 million Chukar partridges, 1 million Mallard ducks, 200,000 wild turkeys, and several other bird species.

Wild Ducks – The Chinese were the first to raise wild ducks domestically for food. Today's domestic wild ducks are descendants of either the Muscovy or Mallard species. America's Long Island ducks are offspring of Pekin ducks (a variety of Mallard) brought from China in the late 1800's. A young duck or duckling (usually under 8 weeks of age) has dark, tender meat and weighs about 3 ½ to 5 pounds. A mature duck is usually over 6 months of age and has tougher meat.

Goose – Geese were farm-raised in ancient Egypt, China, and India. Today's goose weighs between 5 and 18 pounds. A young bird of either sex ("goose" is the female of the species; "gander," the male) has tender meat, while a mature goose of either sex has tougher meat.

Guineafowl – This relative of the chicken and partridge, sometimes called a guinea hen or African pheasant, was thought to originate in Guinea, West Africa. A young guineafowl, about 11 weeks old, has tender meat, while a mature bird has tougher meat. Female guinea fowl are tenderer than males. The meat is light red and slightly dry with a mild gamey flavor. Due to their small size – about 2 to 3 pounds, including giblets, guinea fowl are usually sold whole. Barding with fat helps to keep this lean bird moist.

Partridge – There are no native partridge species in the United States. Most partridge in the market are from European or African varieties. The Grey partridge, a European species, was imported from Hungary and raised in England. Found as far away as the Middle East, this variety is sometimes called Hungarian partridge. Chukar is a partridge species from India.

Pheasant – Originally from Asia, the female of this medium-size game bird (weighing about 3 pounds) has more tender, plump, and juicy meat than the male, which weighs about 5 pounds. Young birds can be roasted, but older birds need moist heat because their flesh is drier and leaner.

Quail – American quail are known regionally by various names: Bobwhite, partridge, and quail (blue, California, mountain and Montezuma). American quail nest on the ground and are not related to the European quail of the partridge family. A ready-to-cook quail weighs about 3 to 7 ounces, including the giblets. Due to their small size, they are usually roasted and served whole. The meat is dark, but mild flavored.

Ratites – This family of flightless birds has small wings and flat breastbones. Ostrich, emu ("E-mew") and rhea ("REE-ah") are members of this family. Ostrich is native to Africa; emu, to Australia; and rhea, to South America — particularly the grasslands of Argentina. The meat looks like beef and the flavor is similar, but a little sweeter. For more information,

see: www.fsis.usda.gov/Fact_Sheets/Ratites_Emu_Ostrich_Rhea/index.asp.

Squab or Pigeon – This species originated in the Middle East and Asia, and is one of the oldest birds known to man. A squab is a young, immature pigeon about 4 weeks old. Because it is too

young to fly, the meat is very tender. Squabs usually weigh about 12 to 16 ounces, including giblets, and have dark, delicately flavored meat. They are usually stuffed whole and roasted. A pigeon has been allowed to mature and has tougher meat than a squab.

Wild Turkeys – Turkey is one of North America's native birds. The name "turkey" was originally applied to an African bird, now known as the guineafowl, which was believed to have originated in Turkey. When the Europeans came upon the American turkey, they thought it was the same bird as the African guinea fowl, and so gave it the name turkey, although the two species are quite distinct. Compared to their domestic counterparts, wild turkeys are leaner, less meaty, not as tender, and have a stronger flavor.

Are game animals inspected by USDA?

Some game animals are inspected by USDA and others by the FDA. USDA's Food Safety and Inspection Service (FSIS) has mandatory inspection authority over all food products from cattle, sheep, swine, goats, horses, mules, and other equines, chickens, turkeys, ducks, geese, guineas, ratites (emu, ostrich, and rhea), and squab. This includes processed products containing more than 3 percent raw meat or 2 percent or more cooked poultry meat.

Additionally, FSIS does voluntary inspection of reindeer, elk, deer, antelope, water buffalo, bison, migratory water fowl (birds that swim such as ducks and geese), game birds, and rabbits.

FDA has jurisdiction over *imported* game not covered by the Federal meat and poultry inspection laws. Meat and poultry exported from another country must meet all safety standards applied to foods produced in the United States, and this must be verified annually.

How are game farm Raised?

Game animals are either raised on farms or ranches. If ranch raised, the animals are allowed to roam at will over hundreds of acres, foraging off foliage. Farm-raised game live in more confined outdoor areas and are fed grains such as wheat, alfalfa, or corn. What the animal eats can affect the taste of the meat.

Game bird species are raised separately from each other. Some birds consider birds from other species as intruders and will kill them.

The chicks need a clean, healthy environment, free of predators and parasites, with lots of clean, fresh water, fresh air, and feed. They are kept in warm buildings with floors covered with litter made of pine shavings, rice or peanut hulls, sugarcane fiber, and ground corncobs. Game birds are fed a diet similar to domestic poultry, typically a low-fat mix which is higher in protein than

that fed to chickens. The feed may contain corn, alfalfa meal, wheat, soybean, meat bone scrap, whey, fish meal, and a vitamin-mineral mix. The FDA regulates animal feed.

When they are a few weeks old, game birds may be transferred to flight cages, typically 130-feet long, 12-feet wide, and 6-feet high, with a floor cover of natural vegetation. There they must be protected from weather extremes, predators, people, and themselves. Access to a shed protects them from the elements.

Are hormones and antibiotics used in game animal production?

Hormones are not used in raising game birds or game animals; however, antibiotics may be used. Wild birds and waterfowl are susceptible to many diseases and parasites, especially where large numbers are being raised in relatively small areas. The FDA approves medications that can be used to treat food animals. Very few drugs have been approved for game birds. Those approved are administered in their feed or water. The drugs are either antibiotics or anti-parasitics.

The FDA has strict guidelines for the use of drugs in animal production. If a drug is given, it must be used according to its labeling. Almost all these drugs require a “withdrawal” period — usually up to 5 days — from the time it is administered until it is legal to slaughter the animal or bird. This is so residues will not be in the meat. FSIS randomly samples the meat at slaughter and tests for any drug residues.

What foodborne bacteria are associated with game?

As with any perishable meat, poultry, or fish, harmful bacteria, such as *Salmonella* and *Escherichia coli* O157:H7, can be found on raw or undercooked game. They live in the intestinal tracts of game, livestock, poultry, dogs, cats, and other warm-blooded animals, and must be eaten to cause illness.

There are about 2,000 serotypes of *Salmonella* bacteria; they are found in all game — both warm- and cold-blooded — including birds, mammals, reptiles and amphibians.

E. coli (including *E. coli* O157:H7 and other serotypes) can colonize in the intestines of animals, which can contaminate muscle meat at slaughter. *E. coli* O157:H7 is a rare strain found in ruminates, including deer. The enterohemorrhagic *E. coli* produce a “Shiga toxin” that causes cell damage and may lead to Hemolytic Uremic Syndrome (HUS), which can cause kidney failure in the very young. A similar illness, thrombotic thrombocytopenic purpura (TTP), may occur in adults.

Bacteria multiply rapidly in the “Danger Zone” — temperatures between 40 and 140 °F. Cross-contamination can occur if raw meat or its juices come in contact with cooked foods or foods that will be eaten raw, such as salad. Freezing does not kill bacteria. Cooking to a safe minimum internal temperature kills bacteria.

How does game meat differ from domestic meat?

Because their diets and activity levels are not the same as that of domestic animals and poultry, the meat of farm-raised game animals has a different flavor—stronger than domesticated species and milder than wild game. The factors that determine the meat's quality include the age of the animal (younger animals are more tender), the animal's diet, and the time of year the animal was harvested. (The best is in the fall, after a plentiful spring and summer feeding.)

Equally important is how the animal was handled in the field. The animal should be eviscerated within an hour of harvest, and the meat refrigerated within a few hours. Meat is damaged (and sometimes ruined) if it is not dressed, transported, and chilled properly.

In general, wild game is less tender than meat from domestic animals because the wild animals get more exercise and have less fat. Any fat is generally bad tasting and should be removed. For maximum tenderness, most game meat should be cooked slowly and not overdone. It can be cooked with moist heat by braising or with dry heat by roasting. Ways to keep game moist include basting, larding, or barding (see "Cooking Methods").

How is Game Handled Safely?

FRESH GAME. Because the demand is not as high as for domestic meats, game is usually sold frozen in supermarkets. However, fresh game is sometimes available. Always select the meat just before checking out at the register. Put fresh game in a disposable plastic bag (if available) to contain any leakage that could cross-contaminate cooked foods or produce. Make the grocery store your last stop before going home.

At home, refrigerate game immediately at 40 °F or below. Cook or freeze (0 °F) game birds and ground game within 1 or 2 days; game animals, within 3 to 5 days. If kept frozen continuously, it will be safe indefinitely.

TYPE OF GAME	ROAST	GRILL/FRY Direct heat	SMOKE Indirect heat*	BRAISE/STEW In liquid; covered
GAME BIRDS:				
Whole bird, 4 to 6 lbs. (Do not stuff.)	350 °F 30 to 35 min./lb.	Not preferred	2 ½ hours	Not preferred
Breast or parts	350 °F 1 to 1 ¼ hrs.	20 to 40 min.	2 hours	60 to 75 min.
Whole small birds	350 °F 45 min.	30 min.	1 to 1 ½ hrs.	45 to 60 min.
GAME ANIMALS:				
Rib Roast, bone in 4 to 6 lbs.	325 °F 27 to 30 min./lb.	Not recommended	Not recommended	Not recommended
Rib Roast, boneless rolled 4 to 6 lbs.	32 to 38 min./lb.	Not recommended	Not recommended	Not recommended
Chuck Roast, Brisket 3 to 4 lbs.	Not recommended	Not recommended	Several hours	325 °F 2 to 3 hours
Round or Rump Roast 2 ½ to 4 lbs.	325 °F 35 to 40 min./lb.	18 to 25 min./ lb.	2 ½ to 3 hours	325 °F 2 to 3 hours
Whole leg (boar, deer) 6 to 8 lbs.	375 °F, 2 hours	Not recommended	3 to 4 hours	Not recommended
Tenderloin whole, 4 to 6 lbs. half, 2 to 3 lbs.	425 °F, 45 to 60 min. total 425 °F, 45 to 60 min. total	12 to 15 min./ side 10 to 12 min./ side	Not recommended Not recommended	Not recommended Not recommended
Steaks, ¾-inch thick	Not recommended	6 to 7 min./side	Not recommended	Not recommended
Ground meat patties	Not recommended	6 to 8 min./side	Not recommended	Not applicable
Meat loaf, 1 to 2 lbs.	350 °F 60 to 90 min.	Not recommended	Not recommended	Not applicable
Stew or Shank Cross Cuts 1 to 1 ½-inch thick	Not recommended	Not recommended	Not recommended	Cover with liquid; simmer 2 to 3 hours
Ribs, 4 inches	375 °F 20 min.	8 to 10 min./ side	Not recommended	Parboil 1 hour; then grill or roast

READY-PREPARED GAME. If picking up cooked game or other fully-cooked product from a restaurant or other foodservice outlet, be sure it is either hot or cold when you pick it up. Use hot food within 2 hours or cut it into several pieces and refrigerate in shallow, covered containers. Eat either cold or reheated to 165 °F. It is safe to freeze ready-prepared game. For recommended storage times, see the chart.

How Do You Reduce the “Gamey” Flavor?

The distinct game flavor of either birds or animals will be milder after soaking the meat overnight in the refrigerator in either a salt or vinegar solution.

- Salt solution – one tablespoon per quart of cold water
- Vinegar solution – one cup per quart of cold water
- Use enough solution to cover the game completely. Discard the solution after soaking.

You can also marinate game to give it a savory flavor or to tenderize it. Always marinate it in the refrigerator (1 to 2 days for birds; 3 to 5 days for game animals). Boil used marinade before basting meat as it cooks or using as a sauce on the cooked meat. Discard any uncooked leftover marinade.

Safe Thawing

There are three safe ways to thaw frozen game: in the refrigerator, in cold water, and in the microwave. Never thaw on the counter. Whole birds or ground meat may take 1 to 2 days or longer to thaw in the refrigerator; roasts, several days. Once the meat thaws, it will be safe in the refrigerator an additional day or two before cooking. Meat and poultry thawed in the refrigerator may be safely refrozen without cooking it first.

To thaw game in cold water, do not remove store packaging. Be sure the packaging is airtight or put it in a leak-proof bag. Submerge the product in cold water, changing the water every 30 minutes. A whole game bird (3 to 4 pounds) or package of parts should defrost in 2 to 3 hours; larger amounts of game may take 4 to 6 hours.

APPROXIMATE GAME COOKING TIMES

Whole game birds are safe cooked to a minimum internal temperature of 165 °F as measured with a food thermometer. Check the internal temperature in the innermost part of the thigh and wing and the thickest part of the breast. For reasons of personal preference, consumers may choose to cook poultry to higher temperatures. Ground meats and other cuts of game meat should reach 160 °F. Approximate cooking times for use in meal planning are given on the chart below.

Classroom Preparation Assignment
Topic 10
Wild Game Identification and Fabrication

Name: _____

Date: _____

1. Game animals that are raised for consumable sale must be _____ inspected by the USDA.
2. Which Federal agency has jurisdiction over imported game for human consumption?
_____.
3. Can you as a chef sell and serve wild game that has been harvested by hunting?
4. What six game animals are covered under the term “venison”?
5. Which wild game animal once numbered in the millions in North American and numbers near 150,000 today? _____.
6. Which wild game is now considered a nuisance and causes much property damage today?
7. What is the most widely raised game bird in America today?
8. Which is the game birds is lean and dry and benefits from barding?
9. Explain who game meat differs from domesticated varieties?
10. Many people eat game because they want the wild flavor, if not how would you go about reducing the “gaminess” before cooking?

Topic Eleven:
Offal Identification and Fabrication

Offal (Variety Meats)

Offal, also referred to as variety meats, is the name for internal organs and entrails of a butchered animal. The word does not refer to a particular list of edible organs, which varies by culture and region, but includes most internal organs excluding muscle and bone. Some cultures shy away from offal as food, while others use it as everyday food or in delicacies.

Some offal dishes are considered delicacies in international cuisine. This includes foie gras, pâté, and sweetbreads. Other offal dishes remain part of traditional regional cuisine and may be consumed especially in connection with holidays such as the Scottish tradition of eating haggis on Robert Burns Day. Intestines are traditionally used as casings for sausages. In South Louisiana pork offal is necessary for the making of Boudin Blanc and Noix.

Depending on the context, offal may also refer to those parts of an animal carcass discarded after butchering or skinning. Offal not used directly for human or animal food is often processed in a rendering plant, producing material that is used for fertilizer or fuel or, in some cases, it may be added to commercially produced pet food. Table 37 lists the most common types of offal from the various species.

Table 37 Common types of offal

Species	Common Offal	Uses/Notes
Beef	Heart	Beef offal is more commonly retailed- Heart is a muscular offal. Cajun stuffed heart and Spanish Anticuchos grilled on a stick.
	Liver	Calf liver is favored. Liver is a glandular offal. Often sautéed with onions
	Kidney	Kidney is a glandular offal. Kidney pie is very European.
	Tongue	Tongue is a muscular offal. Called Lengua in Spanish; it cooks like pot roast and is great on authentic Latin tacos. Braise this.
	Tripe	Tripe is a muscular offal. Used widely in Asian, Latin, and Soul Food categories.
	Oxtail	The only external offal meat and is muscular. Oxtail is braised in stews and soups. Very popular in Latin and Soul food cooking.
Veal	Heart	See beef heart above.

	Liver	Veal offal is more commonly served in restaurants than other types.
	Kidney	See beef kidney above
	Tongue	See beef tongue above.
	Brains	Brains can be prepared like sweetbreads. In the old deep south they were used to “stretch” the eggs when scrambled.
	Sweetbreads	Thymus gland is a glandular offal. Braise, sauté, grill, or fry after preparation technique.
Pork	Liver	Pork offal is stronger in flavor; the liver is most commonly used in pâté.
	Heart	See beef heart.
	Kidney	See beef kidney.
	Intestines	Used for sausage casings and chitterlings.
	Skin	Used to make cracklings or chicharron
	Blood	Used for blood sausage and black pudding (Boudin noir)
Lamb	Liver	Lamb offal is milder in flavor
	Heart	Grilled, or braised
	Kidney	Kidney Pie
	Tongue	Grilled or used for pate.
	Intestines	Used for sausage casings on smaller sausages
Chicken	Heart, Liver, Gizzard, Feet	The first three are often referred to as giblets as a whole. Feet are external and have a large place in Asian and Soul Food.
Duck/Goose	Liver/ Foie Gras	Fatty livers. Raised for centuries. Numerous uses both sweet and savory

Liver: Liver is very fine textured and is almost devoid of the characteristic fiber bundles found in red meat (liver has no grain). Consequently, it is very tender and can be sliced in any direction

needed to attain the best yield. It can be prepared using dry heat. It has a very distinct flavor and is relatively inexpensive.



Grilled calf liver- Maxpixel

Kidney: Kidneys are either smooth, bean-shaped (in lamb and pork) or irregularly shaped with reddish-brown lobes and deep clefts (beef). Beef kidneys are very tough and require intense moist heat cookery.



Beef Kidney- Pixabay

Heart: Heart is retailed whole, halved, or cut into slices depending on species and size. The inside of the heart contains string-like sinew, which should be removed if the heart is being stuffed and cooked. Dry heat is suitable for cooking heart. It is commonly stuffed and roasted whole or slices are seasoned and pan-fried.



Beef Heart- Wikimedia Commons



Anticuchos- Wikipedia Commons

Tongue: The surface of the tongue is very coarse and requires a long period of slow cooking to be able to remove it (six to eight hours of simmering). Once skinned, the tongue can be sliced and is quite tender. There is a very large amount of gelatin in the meat which provides a rich flavor. It is often pickled or corned before cooking.



Cow tongue- Max Pixel

Tripe: Tripe is processed from the muscular inner lining of the stomach. It can be smooth or honey-combed depending on which chamber of the animal's stomach it is harvested from. It is commonly sold fresh or pickled. Washed tripe, also known as dressed tripe, is boiled and bleached, giving it the white color more commonly seen for sale. Tripe requires moist heat cookery to break down its rubber-like texture. It is most commonly used in soups and stews.



Tripe- Wikimedia.org

Sweetbreads: Sweetbreads are the thymus glands of calves and mature beef. They are pinkish-white in color. Veal or calf sweetbreads are considered a great delicacy. They are largest in size when the calf is five to six weeks old and decrease in size as the animal ages. Sweetbreads should be thoroughly soaked in cold water, then blanched so that the membrane can be removed. They then can be braised, or cooled then sliced and breaded for pan frying.



Veal sweetbreads with fried onions and tomato ragu- photo Chef Marshall Welsh CEC

Brain: Brains are a small volume seller. They perish very quickly so are generally frozen at the plant as soon as they are harvested from the animal. They are mild in flavor and have a delicate texture. Calves brains are most commonly used. They can be prepared much the same as sweetbreads. Brain is extremely high in cholesterol.



Lamb brains- Wikimedia commons

Oxtail: Oxtail is classified as offal even though it is not an internal organ. Oxtail is mainly used for making soup to extract its rich flavors. It is more bone than meat, but the meat from the oxtail, once properly braised, is very rich in flavor.



Oxtail - Wikimedia Commons

Cheeks and head: These are not technically offal, but increasingly popular are beef and veal cheeks, while pork heads are used to make headcheese, a type of sausage consisting of the meat from the head set in a gelatin base made from the cooking liquid.



Beef Cheeks in a retail pack - Wikimedia Commons

Caul fat: Fine membrane of fat which covers the stomach of hogs, Caul fat is used for barding (wrapping or covering) lean cuts of meat, ground fillings and sausage meat.



Ground pork wrapped in Caul Fat - Wikimedia commons



Foie Gras at market in raw form – Flickr



Ground Kobe Burger with Torchon du Frio Gras- Flickr



Duo of Foie Gras torchon and Seared Foie Gras with Gastrique- Flickr



Flan of Foie Gras at el Bulli- Flickr



Chicken Feet – Wikimedia Commons

Classroom Preparation Assignment**Topic Eleven***Offal*

Name: _____ Date: _____

1. According to the text, some offal dishes are considered delicacies in international cuisine. Which three were highlighted here?
2. In the market place what is another word for offal?
3. Name three items from the offal category that are muscular.
4. Name three items from the offal category that are glandular.
5. Anticuchos is a Latin dish made from the _____.
6. Sweetbreads come from the _____.
7. Long and slow cooking is required for this offal to become tender before it can be peeled and used. What is it? _____.
8. This offal can be smooth or honey-combed and needs moist heat methods to break down its rubbery texture. It is often used in soups and stews. What is it?
_____.
9. This offal is particularly prized when obtained from the younger of its species as it is larger in the animal when young and decreases in size as the animal gets older. What is this offal?
10. Which offal is “Royalty”, raised for centuries, and has uses in both sweet and savory dishes?

Topic Twelve:
International Sausage Making

Sausages

The term refers to a mixture of minced or ground seasoned products (usually meat). As is most often the case chefs use the “lesser” cuts which normally include the less tender, less prized, and less expensive cuts of the animal. If you have ever heard the saying, “eating high off the hog”, know that this refers to the more expensive and tender cuts that are found higher on the animal. The lesser and tougher cuts are found lower on the animal. They lend themselves to braising (low and slow) or grinding to help them become palatable.

Our word “sausage” comes from the Latin word “*Salsus*” meaning salted. Early Greeks and Romans were among the first to make sausages.

Six basic components of sausage

1. **Main ingredient**
2. **Fat**
3. **Seasonings and cure mixtures**
4. **Spices**
5. **Herbs**
6. **Aromatics**

Sometimes animal or synthetic casings are used to hold sausages in a link or tube shape, but casing are not considered as a basic component due to the fact that many sausages today are made into patties or packaged in a bulk form.

Main ingredient- Usually a tough cut of meat from the leg or shoulder



An example of meat after the grinding process - Wikimedia commons

Fat

Two common forms of fat in the sausage process are pork fat and heavy cream. Fat is an essential ingredient which has three distinct purposes in the making of good sausage. Fat provides *moisture, satiety, and flavor*.



Pork Fat. Photo: Max Pixel

Seasonings and cure mixes

As discussed earlier in **Topic Three**, sugars (in many forms), salts (likewise), and various curing agents are necessary in the charcuterie process. These help to prevent food borne illness, add flavor, and lastly where hot smoking is concerned, sugar helps to act as a browning agent in the cooking process. The curing agents are especially useful when seasoning with herbs and garlic due to the opportunity for microbe contamination found in the soil. Often chefs cook the garlic and herbs or otherwise sterilize them prior to adding them to the raw meats. This is especially a good idea if the curing process will be done without cooking.



Prague powder I, known as TCM or Pink Salt- Wikimedia Commons

Spices and Herbs

Spices may be toasted or untoasted and can vary form product type and style. They may be whole, ground, or from a prepared mix. Herbs may be fresh or dried. Italian sausage can be sweet or hot but usually has whole fennel seed in the recipe. Merguez is a Mediterranean sausage from North Africa which utilizes ground spices from the pantry of Tunisia. The French are noted for a mixture of spices called *Quatre Espices* and can be found in anything from pate to confit of duck. One popular recipe for Quatre Espices is one part ground cinnamon, one part ground cloves, one and one-half part ground nutmeg, and two parts ground black pepper.



Spices commonly used in Quatre Espices- Commons Wikimedia.org

Aromatics

Aromatics include wine, liquors, and zests, prepared sauces such as Worcestershire and Tabasco, and vegetables which as stated before as often cooked first. In Cajun country we are very familiar with Boudin, a sausage of rice and pork (primarily liver). Our beloved trinity of celery, onions, and bell pepper place a big role in the making of all our dishes especially Boudin. During crawfish season you can find Crawfish Boudin and I've seen red bell pepper used here over the normal green pepper found in the pork version.



Examples of aromatics used in sausage making- Wikimedia.org and Picryl

Natural and Synthetic Casings in Sausage Making

We shall only use natural casing for the purpose of our beginning foray into charcuterie but let's discuss what's available to chefs who want to pursue this line of work. Synthetic casings are made for a variety of food grade materials, some of which are non-edible. Natural casing come from the intestines of sheep, pork, and cattle and should be washed in water and vinegar.



Natural casing example- Wikimedia

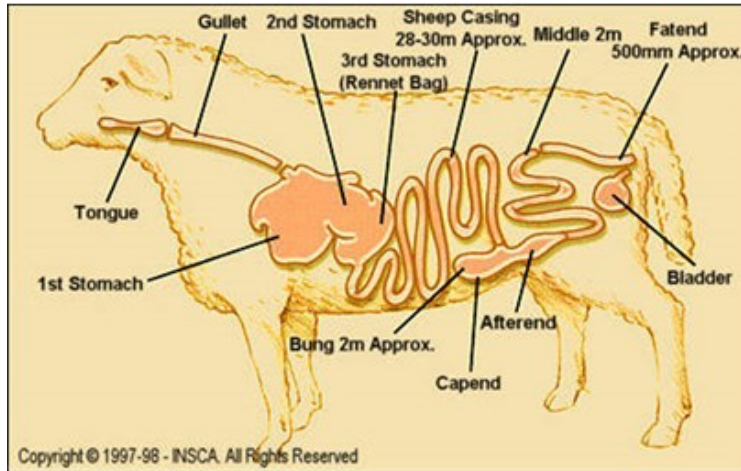
Synthetic casings can be made from cotton, cellulose, or collagen which comes from the corium layer of split beef hide. Be careful to remove such casings prior to serving to guests.



Synthetic casing examples- Wikimedia Commons

Sheep Casings-

Often referred to as “*sheep hanks*”, these casing provide the smallest of the three intestines used in sausage making. Merguez is traditionally made with sheep hanks for a slender sausage of 24-26 millimeters up to 30mm.

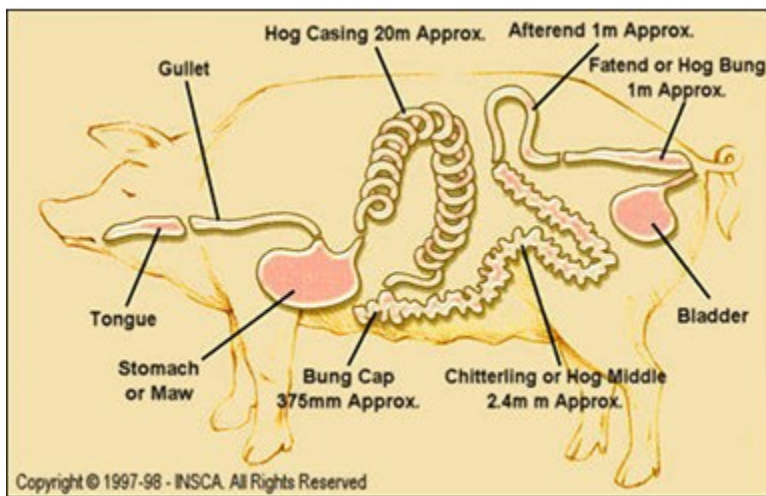


Sheep offal relating to sausage making from INSCA

Refer to course handouts and or recipes provided by your instructor via the LMS (Learning Management System) ex. Moodle®.

Hog Casings

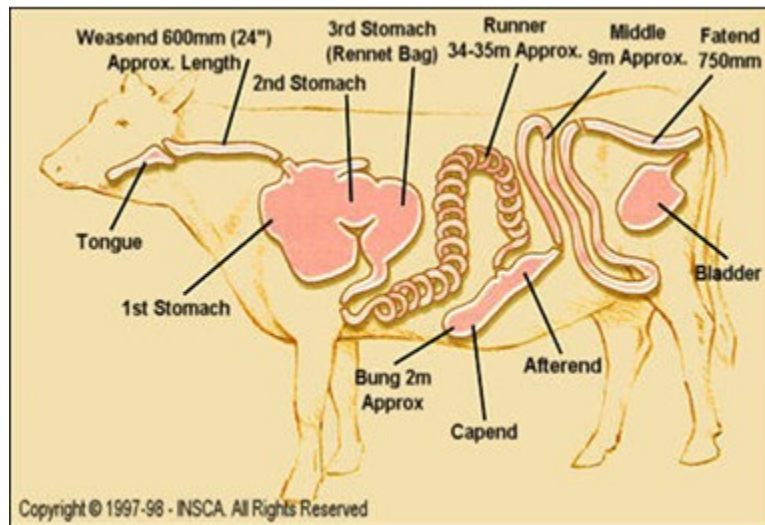
Hog casings are referred to as **“Hanks”** also and we will use the intestine for many sausage preparations. The intestines are larger than sheep hanks and come threaded on rings and shipped in a salt mixture to fight bacteria. They are washed and threaded into a stuffing tube to be filled. **Middles** are even larger and used for specialty sausages such as the Saucisson Sec, a dried pork and garlic sausage.



Hog offal relating to sausage making from INSCA

Beef Runners and Middles

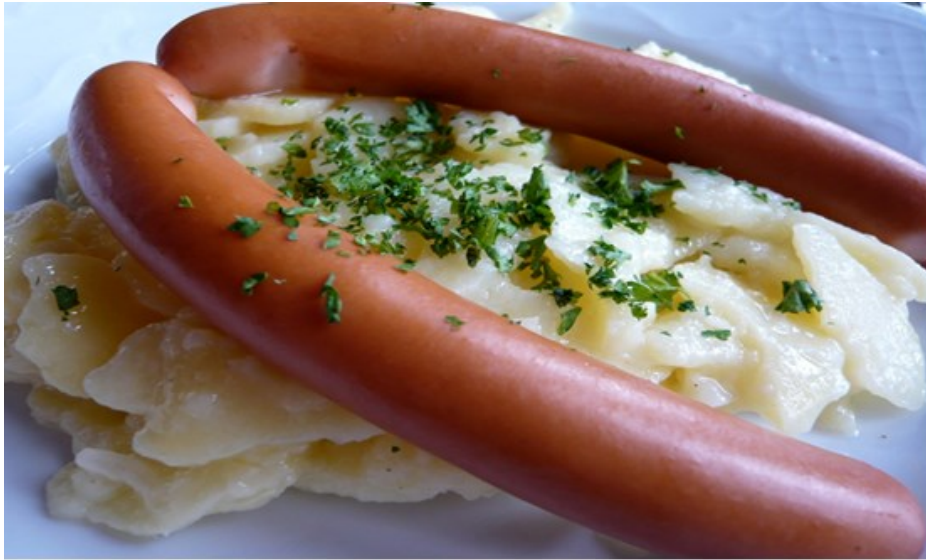
Beef offers the largest size intestine up to 65 millimeters and is best suited for Cajun Andouille Sausage. They are often shipped in plastic buckets in a salt medium and should be washed and threaded onto the largest of the stuffer tubes when making sausage.



Beef offal relating to sausage making from INSCA



Polish white pork kielbasa- Wikimedia commons



German frankfurters with German warm potato salad- Flickr



German Bratwurst- Max Pixel



Sweet Italian Sausage- Pixnio



Chorizo Sausage- Wikimedia Commons

Refer to course handouts and or recipes provided by your instructor via the LMS (Learning Management System) ex. Moodle®.

Classroom Preparation Assignment

Topic: Ten

Sausage Making

Name: _____

Date: _____

1. T or F. Circle one. When making sausages, we should use the lesser and tougher cuts.
2. What does the Latin word “Salsus” mean?
3. What are the six basic components of sausage?
4. What three things does fat provide for sausage?
5. Salts and curing agents do three things for sausage; what are they?
6. What is the name of the spice we associate with Italian sausage?
7. Name the five aromatics used in sausage making.
8. What are the three Equipment Mise En Place categories noted in Topic 11?
9. After the housing is mounted on the grinder, what part goes on next?
10. What part is assembled after the worm or auger?
11. When mounting the blade, which side faces out?
12. Describe the progressive grinding technique.
13. What is produced inside fermented sausage to make the tangy flavor?
14. What do the salts and sugars do during sausage fermentation?
15. What is the white mold on fermented sausage called?

Topic Thirteen:
Shellfish Identification and Fabrication

Shellfish

Shellfish are aquatic invertebrates with shells or carapaces. They are found in both fresh and salt water.

Always an important food source, shellfish have become increasingly popular in recent years, due in part to demands from health-conscious consumers. Because of increased demand and improved preservation and transportation techniques, good-quality shellfish, once found only along seacoasts and lakes, are now readily available to almost every food service operation.

Many shellfish species are very expensive; all are highly perishable. Because their cooking times are generally shorter and their flavors more delicate than meat or poultry, special attention must be given to fish and shellfish to prevent spoilage and to produce high-quality finished products.

STRUCTURE and MUSCLE COMPOSITION

Mollusks are shellfish characterized by soft, unsegmented bodies with no internal skeleton. Most mollusks have hard outer shells. Single-shelled mollusks such as abalone are known as **univalves**. Those with two shells, such as clams, oysters and mussels, are known as **bivalves**. Squid and octopus, which are known as **cephalopods**, do not have a hard outer shell. Rather, they have a single thin internal shell called a pen or cuttlebone.

Crustaceans are also shellfish. They have a hard outer skeleton or shell and jointed appendages. Crustaceans include lobsters, crabs and shrimp.

The flesh of fish and shellfish consists primarily of water, protein, fat and minerals. Fish flesh is composed of short muscle fibers separated by delicate sheets of connective tissue. Fish, as well as most shellfish, are naturally tender, so the purpose of cooking is to firm proteins and enhance flavor. The absence of the oxygen-carrying protein myoglobin makes fish flesh very light or white in color. (The orange color of salmon and some trout comes from pigments found in their food.) Compared to meats, fish do not contain large amounts of intermuscular fat. However, the amount of fat a fish does contain affects the way it responds to cooking. Fish containing a relatively large amount of fat, such as salmon and mackerel, are known as fatty or oily fish. Fish such as cod and haddock contain very little fat and are referred to as lean fish. Shellfish are also very lean.

IDENTIFYING SHELLFISH

Identifying fish and shellfish properly can be difficult because of the vast number of similar-appearing fish and shellfish that are separate species within each family. Adding confusion are the various colloquial names given to the same fish or the same name given to different fish in different localities. Fish with an unappealing name may also be given a catchier name or the name of a similar but more popular item for marketing purposes. Moreover, some species are referred to by a foreign name, especially on menus.

The FDA publishes a list of approved market names for food fish in *The Seafood List: FDA Guide to Acceptable Market Names for Food Fish Sold in Inter- state Commerce 2002*. The list is updated regularly and available on the FDA's Web site at the Center for Food Safety and Applied Nutrition. Deviations from this list are strongly discouraged but difficult to enforce. We attempt to use the most common names for each item, whether they are zoologically accurate or not.

MOLLUSKS

Univalves

Univalves are mollusks with a single shell in which the soft-bodied animal resides. They are actually marine snails with a single foot, used to attach the creature to fixed objects such as rocks.



Abalone discus



Abalone breakfast

Abalone have brownish-gray, ear-shaped shells. They are harvested in California, but California law does not permit canning abalone or shipping it out of state. Some frozen abalone is available from Mexico; canned abalone is imported from Japan. Abalone are lean with a sweet, delicate flavor similar to that of clams. They are too tough to eat unless tenderized with a mallet or rolling pin. They may then be eaten raw or prepared ceviche -style. Great care must be taken when grilling or sautéing abalone, as the meat becomes very tough when overcooked.



Conch

Conch are found in warm waters off the Florida Keys and in the Caribbean. Beachcombers prize the beautiful peachy-pink shell of the queen conch. Conch meat is lean, smooth and very firm with a sweet-smoky flavor and chewy texture. It can be sliced and pounded to tenderize it, eaten raw with lime juice or slow-cooked whole.



Small Escargot snails

Snails. Although snails (more politely known by their French name, escargots) are univalve land animals, they share many characteristics with their marine cousins. They can be poached in court bouillon; removed from their shells and boiled; or baked briefly with a seasoned butter, or sauce. They should be firm but tender; overcooking makes snails tough and chewy. The most popular varieties are the large white Burgundy snail and the small garden variety called petit gris.

Fresh snails are available from snail ranches through specialty suppliers. The great majority of snails, however, are available canned; most canned snails are the product of France or Taiwan.

Bivalves

Bivalves are mollusks with two bilateral shells attached by a central hinge.



Clams



Clam shell

Clams are harvested along both the East and West Coasts, with Atlantic clams being more significant commercially. Atlantic Coast clams include hard-shell, soft-shell and surf clams. Clams are available all year, either live in the shell or fresh -shucked (meat removed from the shell). Canned clams, whether minced, chopped, or whole, are also available.

Atlantic hard-shell clams or quahogs have hard, blue-gray shells. Their chewy meat is not as sweet as other clam meat. Quahogs have different names, depending upon their size. Littlenecks are generally under 2 inches (5 centimeters) across the shell and usually are served on the half shell or steamed. They are the most expensive clams.



Cherrystones are generally under 3 inches (7.5 centimeters) across the shell and are sometimes eaten raw but are more often cooked.

Top necks are usually cooked and are often served as stuffed clams.

Chowders, the largest quahogs, are always eaten cooked, especially minced for chowder or soup.

Soft-shell clams, also known as Ipswich, steamer and long-necked clams, have thin, brittle shells that do not completely close because of the clam's protruding black-tipped siphon. Their meat is tender and sweet. They are sometimes fried but are more often served steamed.

Surf clams are deep-water clams that reach sizes of 8 inches (20 centimeters) across. They are most often cut into strips for frying or are minced, chopped, processed and canned.

Pacific clams are generally too tough to eat raw. The most common is the **Manila clam**, which was introduced along the Pacific coast during the 1930s. Resembling a quahog with a ridged shell, it can be served steamed or on the half shell. **Geoducks** are the largest Pacific clam, sometimes weighing up to 10 pounds (4.5 kilograms) each. They look like huge soft-shell clams with a large, protruding siphon. Their tender, rich bodies and briny flavor are popular in Asian cuisines.



Cockles

Cockles are small bivalves, about 1 inch (2.5 centimeters) long, with ridged shells. They are more popular in Europe than the United States and are sometimes used in dishes such as paella and fish soups or stews.



Mussels

Mussels are found in waters worldwide. They are excellent steamed in wine or seasoned broth and can be fried or used in soups or pasta dishes.

Blue mussels are the most common edible mussel. They are found in the wild along the Atlantic Coast and are aqua- farmed on both coasts. Their meat is plump and sweet with a firm, muscular texture. The orangey-yellow meat of cultivated mussels tends to be much larger than that of wild mussels and therefore worth the added cost. Blue mussels are sold live in the shell and average from 10 to 20 per pound. Although available all year, the best-quality blue mussels are harvested during the winter months.

Green shell (or green lip) mussels from New Zealand and Thailand are much larger than blue mussels, averaging 8 to 12 mussels per pound. Their shells are paler gray, with a distinctive bright green edge.



Oysters

Oysters have a rough gray shell. Their soft, gray, briny flesh can be eaten raw directly from the shell. They can also be steamed or baked in the shell or shucked and fried, sautéed or added to stews or chowders. Most oysters available in the United States are commercially grown and sold either live in the shell or shucked. There are four main domestic species.

Atlantic oysters, also called American or Eastern oysters, have darker, flatter shells than other oysters.

European flat oysters are often incorrectly called Belon (true Belon oysters live only in the Belon river of France); they are very round and flat and look like giant brownish-green Olympias.

Olympias are the only oysters native to the Pacific Coast; they are tiny (about the size of a 50-cent coin).

Pacific oysters, also called Japanese oysters, are aqua - farmed along the Pacific Coast; they have curly, thick striated shells and silvery-gray to gold to almost -white meat. Although it may seem as though there are hundreds of oyster species on the market, only two are commercially significant: the Atlantic oyster and the Pacific oyster. These two species yield dozens of different varieties, however, depending on their origin. For example, Atlantic oysters may be referred to as blue points, Chesapeake Bay, Florida Gulf, Long Island and so on, while Pacific oysters include Penn Cove Select, Westcott Bay, Hamma-Hamma, Kumamoto and Portuguese, among others. An oyster's flavor reflects the minerals, nutrients and salts in its water and mud bed, so a Bristol from Maine and an Apalachicola from Florida will taste very different, even though they are the same Atlantic species.

Scallops contain an edible white adductor muscle that holds together the fan -shaped shells. Because they die quickly, they are usually shucked, and cleaned on board the ship. The sea

scallop and the bay scallop, both cold-water varieties, and the calico scallop, a warm-water variety, are the most important commercially. Sea scallops are the largest, with an average count of 20 to 30 per pound. Larger sea scallops are also available.

Bay scallops average 70 to 90 per pound; calico scallops average 70 to 110 per pound. Fresh or frozen shucked, cleaned scallops are the most common market form, but live scallops in the shell and shucked scallops with roe attached (very popular in Europe) are also available. Scallops are sweet, with a tender texture. Raw scallops should be a translucent ivory color and non-symmetrically round and should feel springy. They can be steamed, broiled, grilled, fried, sautéed, or baked. When overcooked, however, scallops quickly become chewy and dry. Only extremely fresh scallops should be eaten raw.

CEPHALOPODS

Cephalopods are marine mollusks with distinct heads, well-developed eyes, a number of arms that attach to the head near the mouth and a saclike fin-bearing mantle. They do not have an outer shell; instead, there is a thin internal shell called a pen or cuttlebone.

Octopus is generally quite tough and requires mechanical tenderization or long, moist-heat cooking to make it palatable. Most octopus is imported from Portugal, though fresh ones are available on the East Coast during the winter. Octopus is sold by the pound usually fresh, frozen, or whole. Octopus skin is gray when raw, turning purple when cooked. The interior flesh is white, lean, firm and flavorful.

Squid, known by their Italian name, calamari, are becoming increasingly popular in the United States. Similar to octopuses but much smaller, they are harvested along both American coasts and elsewhere around the world, (the finest are the East Coast loligo or winter squid). They range in size from an average of 8 to 10 per pound to the giant South American squid, which is sold as tenderized steaks. The squid's tentacles, mantle (body tube) and fins are edible. Squid meat is white to ivory in color, turning darker with age. It is moderately lean, slightly sweet, firm and tender, but it toughens quickly if overcooked. Squid are available either fresh or frozen and packed in blocks.

CRUSTACEANS

Crustaceans are found in both fresh and salt water. They have a hard outer shell and jointed appendages, and they breathe through gills.

*Crayfish**Boiled Crayfish*

Crayfish generally called crayfish in the North and ‘crawfish’ or ‘crawdada’ in the South, are freshwater creatures that look like miniature lobsters. They are harvested from the wild or aqua farmed in Louisiana and the Pacific Northwest. They are from 3 1/2 to 7 inches (8 to 17.5 centimeters) in length when marketed and may be purchased live or precooked and frozen. The lean meat, found mostly in the tail, is sweet and tender. Crayfish can be boiled whole, and served hot or cold. The tail meat can be deep-fried, or used in soups, bisque or sauces. Crayfish are a staple of Cajun cuisine, often used in gumbo, etouffee and jambalaya. Whole crayfish become brilliant red when cooked, and useful as a garnish.

*Atlantic blue crab**Snow crab*



Dungeness crab



Stone crab



Alaskan king crab

Crabs are found along the North American coast in great numbers and are shipped throughout the world in fresh, frozen and canned forms. Crab meat varies in flavor and texture and can be used in a range of prepared dishes, from chowders to curries to casseroles. Crabs purchased live should last up to five days; dead crabs should not be used.

King crabs are very large crabs (usually around 10 pounds [4.4 kilograms] caught in the very cold waters of the northern Pacific. Their meat is very sweet and snow-white. King crabs are always sold frozen, usually in the shell. In-shell forms include sections or clusters legs and claws or split legs. The meat is also available in "fancy" packs of whole leg and body meat, or shredded and minced pieces.

Dungeness crabs are found along the West Coast. They weigh 1 1/2 to 4 pounds (680 grams to 1.8 kilograms) and have delicate, sweet meat. They are sold live, precooked and frozen, or as picked meat, usually in 5-pound (2.2 -kilogram) vacuum - packed cans.

Blue crabs are found along the entire eastern seaboard and account for approximately 50 percent of the total weight of all crab species harvested in the United States. Their meat is rich and sweet. Blue crabs are available as hard-shell or soft-shell. Hard-shell crabs are sold live, precooked and frozen, or as picked meat. Soft-shell crabs are those harvested within six hours after molting and are available live (generally only from May 15 to September 15) or frozen . They are often steamed and served whole. Soft-shells can be sautéed, fried, broiled or added to soups or stews. Blue crabs are sold by size, with an average diameter of 4 to 7 inches (10 to 18 centimeters).

Snow or spider crabs are an abundant species, most often used as a substitute for the scarcer and more expensive king crab. They are harvested from Alaskan waters and along the eastern coast of Canada. Snow crab is sold precooked, usually frozen. The meat can be used in soups, salads, omelets or other pre- pared dishes. Legs are often served cold as an appetizer.

Stone crabs are generally available only as cooked claws, either fresh or frozen (the claws cannot be frozen raw because the meat sticks to the shell). In stone crab fishery, only the claw is harvested. After the claw is removed, the crab is returned to the water, where in approximately 18 months it regenerates a new claw. Claws average 2 1/2 to 5 1/2 ounces (75 to 155 grams) each. The meat is firm, with a sweet flavor similar to lobster. Cracked claws are served hot or cold, usually with cocktail sauce, lemon butter, or other accompaniments.



Lobster

Lobsters have brown to blue -black outer shells and firm, white meat with a rich, sweet flavor. Lobster shells turn red when cooked. They are usually poached, steamed, simmered, baked or grilled, and can be served hot or cold. Picked meat can be used in prepared dishes, soups or sautés. Lobsters must be kept alive until just before cooking. Dead lobsters should not be eaten.

The Maine, also known as American or clawed lobster, and the spiny lobster are the most commonly marketed species.

Maine lobsters have edible meat in both their tails and claws; they are considered superior in flavor to all other lobsters. They come from the cold waters along the northeast coast and are most often sold live. Maine lobsters may be purchased by weight (for example, 1 1/4 pounds [525 grams], 1 1/2 pounds [650 grams] or 2 pounds [900 grams] each), or as "chix (that is, a lobster weighing less than 1 pound [450 grams]). Maine lobsters may also be purchased as 'culls' (lobsters with only one claw) or 'bullets' (lobsters with no claws). They are available frozen or as cooked, picked meat.



Spiny lobster

Spiny lobsters, harvested in many parts of the world, have very small claws and are valuable only for their meaty tails, which are notched with short spines. Nearly all spiny lobsters marketed in this country are sold as frozen tails, often identified as rock lobster. Those found off Florida and Brazil and in the Caribbean are marketed as warm-water tails; those found off South Africa, Australia and New Zealand are called cold-water tails. Cold-water spiny tails are considered superior to their warm-water cousins.

Slipper lobster, lobsterette, and squat lobster are all clawless species found in tropical, subtropical and temperate waters worldwide. Although they are popular in some countries, their flavor is inferior to that of both Maine and spiny lobsters. Langoustines are small North Atlantic lobsters.

*Shrimp**Brown shrimp**White shrimp**Boiled shrimp*

Shrimp are found worldwide and are widely popular. Gulf whites, pinks, browns, and black tigers are just a few of the dozens of shrimp varieties used in food service operations. Although fresh, head-on shrimp are available, the most common form is raw, head-off (also called green headless) shrimp with the shell on. Most shrimp are de-headed and frozen at sea to preserve freshness.

Shrimp are available in many forms: raw, peeled and deveined; cooked, peeled and deveined; and individually quick-frozen, as well as in a variety of processed, breaded or canned products. Shrimp are graded by size, which can range from 400 per pound to 8 per pound (extra-colossal), and are sold in counts per pound. For example, shrimp marketed as "21- 26 count" means that there is an average of 21 to 26 shrimp per pound; shrimp marketed as "U-10" means that there are fewer than 10 shrimp per pound.

*Prawn**Tiger prawn*

Prawn is often used interchangeably with the word shrimp in English speaking countries. Although it is perhaps more accurate to refer to fresh-water species as prawns, and saltwater species as shrimp, in commercial practice, prawn refers to any large shrimp. Equally confusing, scampi is the Italian name for the Dublin Bay prawn (which is actually a species of miniature lobster), but in the United States scampi refers to shrimp sautéed in garlic butter.

*African shrimp**African Fan Shrimp*

Nutrition

Fish and shellfish are low in calories, fat and sodium, and are high in protein and vitamins A, Band D. Fish and shellfish are also high in minerals, especially calcium (particularly in canned fish with edible bones), phosphorus, and potassium and iron (especially mollusks). Fish are high in a group of polyunsaturated fatty acids called omega-3, which may help combat high blood cholesterol levels and aid in preventing some heart disease. Shellfish are not as high in cholesterol as was once thought. Crustaceans are higher in cholesterol than mollusks, but both have considerably lower levels than red meat or eggs.

The cooking methods used for fish and shellfish also contribute to their healthfulness. The most commonly used cooking methods are broiling, grilling, poaching and steaming-add little or no fat.

Inspection

Unlike mandatory meat and poultry inspections, fish and shellfish inspections are voluntary. They are performed in a fee-for-service program supervised by the United States Department of Commerce (USDC).

Type 1-inspection services cover plant, product and processing methods from the raw material to the final product. The "Packed under Federal Inspection" (PUFI) mark or statement can be used on product labels processed under Type 1 inspection services. It signifies that the product is safe and wholesome, is properly labeled, has reasonably good flavor and odor and was produced under

~Procedure for Preparing Live Lobsters for Sautéing~

A whole lobster may also be cut into smaller pieces for sautéing or other preparations.

1. Using the point of a chef's knife, pierce the lobster's head.
2. Cut off the claws and arms.
3. Cut the tail into cross-sections.
4. Split the head and thorax in half. The tomalley and coral (if present) can be removed and saved for further use. The head and legs may be added to the recipe for flavor, but there is very little meat in them and they are typically discarded.
5. Crack the claws with a firm blow, using the back of a chef's knife.

~Procedure for Opening Clams~

Opening raw clams efficiently requires practice. Like all mollusks, clams should be cleaned under cold running water with a brush to remove all mud, silt and sand that may be stuck to their shells. A knife may be more easily inserted into a clam if the clam is washed and allowed to relax in the refrigerator for at least one hour before it is opened.

1. Hold the clam firmly in a folded towel in the palm of your hand; the notch in the edge of the shell should be toward your thumb.
2. With the fingers of the same hand, squeeze and pull the blade of the clam knife between the clamshells. Do not push on the knife handle with your other hand; you will not be able to control the knife if it slips and you can cut yourself.

3. Pull the knife between the shells until it cuts the muscle. Twist the knife to pry the shells apart. Slide the knife tip along the top shell and cut through the muscle. Twist the top shell, breaking it free at the hinge; discard it.
4. Use the knife tip to release the clam from the bottom shell.

~Procedure for Opening Oysters~

1. Clean the oyster by brushing it under running water.
2. Hold the cleaned oyster firmly in a folded towel in the palm of your hand. Insert the tip of an oyster knife in the hinge and use a twisting motion to pop the hinge apart. Do not use too much forward pressure on the knife; it can slip and you could stab yourself
3. Slide the knife along the top of the shell to release the oyster from the shell. Discard the top shell.
4. Use the knife tip to release the oyster from the bottom shell.
5. Fresh raw oysters on the half shell with seaweed garnish.

~Procedure for Cleaning and De-bearding Mussels~

Mussels are not normally eaten raw. Before cooking, a clump of dark threads called the beard must be removed. Because this could kill the mussel, cleaning and de-bearding must be done as close to cooking time as possible.

- 1 Clean the mussel with a brush under cold running water to remove sand and grit.
- 2 Pull the beard away from the mussel with your fingers or a small pair of pliers.

~Procedure for Preparing Live Lobsters for Boiling~

A whole lobster can be cooked by plunging it into boiling water or court bouillon. If the lobster is to be broiled, it must be split lengthwise before cooking.

1. Place the live lobster on its back on a cutting board and pierce its head with the point of a chef's knife.
2. Then, in one smooth stroke, bring the knife down and cut through the body and tail without splitting it completely in half.
3. Use your hands to crack the lobsters back so that it lies flat. Crack the claws with the back of a chef's knife.
4. Cut through the tail and curl each half of the tail to the side. Remove and discard the stomach. The tomalley (the olive-green liver) and, if present, the coral (the roe) can be removed and saved for a sauce or other preparation

Various Cooking Methods. Fish and shellfish can be prepared by the dry-heat cooking methods of broiling and grilling, roasting (baking), sautéing, pan-frying and deep-frying , as well as the moist-heat cooking methods of steaming, poaching and simmering.



Packed under Federal Inspection (PUFI)

Type 2-inspection services are usually performed in a warehouse, processing plant or cold storage facility on specific product lots. A lot inspection determines whether the product complies with purchase agreement criteria (usually defined in a spec sheet) such as condition, weight, labeling and packaging integrity.

Type 3-inspection services are for sanitation only. Fishing vessels or plants that meet the requirements are recognized as official establishments and are included in the *USDC Approved List of Fish Establishments and Products*. The list is available to governmental and institutional purchasing agents as well as to retail and restaurant buyers. Updated copies of the list are published on the Internet.

Grading

Only fish processed under Type 1 inspection services are eligible for grading. Each type of fish has its own grading criteria, but because of the great variety of fish and shellfish, the USDC has been able to set grading criteria for only the most common types. The grades assigned to fish are A, B or C.



Grade A products are top quality and must have good flavor and odor and be practically free of physical blemishes or defects. The great majority of fresh and frozen fish and shellfish consumed in restaurants is Grade A. Grade B indicates good quality; Grade C indicates fairly good quality. Grade B and C products are most often canned or processed.

PURCHASING and STORING FISH and SHELLFISH

Determining Freshness

Because fish and shellfish are highly perishable, an inspection stamp does not necessarily ensure top quality. A few hours at the wrong temperature or a couple of days in the refrigerator can turn high-quality fish or shellfish into garbage. It is important that chefs be able to determine for themselves the freshness and quality of the fish and shellfish they purchase or use. Freshness should be checked before purchasing and again just before cooking.

Determined freshness by the following criteria:

- **Smell** - This is by far the easiest way to determine freshness. Fresh fish should have a slight sea smell or no odor at all. Any off-odors or ammonia odors are a sure sign of aged or improperly handled fish.
- **Eyes** - The eyes should be clear and full. Sunken eyes mean that the fish is drying out and is probably not fresh.
- **Gills** - The gills should be intact and bright red. Brown gills are a sign of age.
- **Texture** - Generally, the flesh of fresh fish should be firm. Mushy flesh or flesh that does not spring back when pressed with a finger is a sign of poor quality or age.
- **Fins and scales** - Fins and scales should be moist and full without excessive drying on the outer edges. Dry fins or scales are a sign of age; damaged fins or scales may be a sign of mishandling.
- **Appearance** - Fish cuts should be moist and glistening, without bruises or dark spots. Edges should not be brown or dry.

- **Movement** - Shellfish should be purchased live and should show movement. Lobsters and other crustaceans should be active. Clams, mussels and oysters that are partially opened should snap shut when tapped with a finger. (Exceptions are geoduck, razor and steamer clams whose siphons protrude, preventing the shell from closing completely.) Ones that do not close are dead and should not be used. Avoid mollusks with broken shells or heavy shells that might be filled with mud or sand.

Purchasing Fish and Shellfish

Fish are available from wholesalers in a variety of market forms:

- **Whole or round** - As caught, intact.
- **Drawn-Viscera** - (internal organs) are removed; most whole fish are purchased this way.

Seafood Freezing Terminology

- ✓ **Fresh** - The item is not and has never been frozen.
- ✓ **Chilled** - Now used by some in the industry to replace the more ambiguous "fresh"; indicates that the item was refrigerated, that is, held at 30°F to 34°F (- 1°C to 1 °C).
- ✓ **Flash-frozen** - The item was quickly frozen on board the ship or at a processing plant within hours of being caught.
- ✓ **Fresh-frozen** - The item was quick-frozen while still fresh but not as quickly as flash-frozen.
- ✓ **Frozen** - The item was subjected to temperatures of 0°F (- 18°C) or lower to preserve its inherent quality.
- ✓ **Glazed** - A frozen product dipped in water; the ice forms a glaze that protects the item from freezer burn.
- ✓ **Fancy** - Code word for "previously frozen."

STORING FISH and SHELLFISH

The most important concern when storing fish and shellfish is temperature. All fresh fish should be stored at temperatures between 30°F and 34°F (- 1°C to 1°C). Fish stored in a refrigerator at 41°F (5°C) will have approximately half the shelf life of fish stored at 32°F (0°C).

Most fish are shipped on ice and should be stored on ice in the refrigerator as soon as possible after receipt. Whole fish should be layered directly in crushed or shaved ice in a perforated pan so that the melted ice water drains away. If crushed or shaved ice is not available, cubed ice may be used provided it is put in plastic bags and gently placed on top of the fish to prevent bruising and denting. Fabricated and portioned fish may be wrapped in moisture-proof packaging before

icing to prevent the ice and water from damaging the exposed flesh. Fish stored on ice should be drained and re-iced daily.

Fresh scallops, fish fillets that are purchased in plastic trays and oyster and clam meats should be set on or packed in ice. Do not let the scallops, fillets or meats come into direct contact with the ice.

Clams, mussels and oysters should be stored at 41°F (5°C), at high humidity and left in the boxes or net bags in which they were shipped. Under ideal conditions, shellfish can be kept alive for up to one week. Never store live shellfish in plastic bags and do not ice them.

If a saltwater tank is not available, live lobsters, crabs and other crustaceans should be kept in boxes with seaweed or damp newspaper to keep them moist. Most crustaceans circulate salt water over their gills; icing them or placing them in fresh water will kill them. Lobsters and crabs will live for several days under ideal conditions.

Like most frozen foods, frozen fish should be kept at temperatures of 0°F (-18°C) or colder. Colder temperatures greatly increase shelf life. Frozen fish should be thawed in the refrigerator; once thawed, they should be treated like fresh fish.

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2. Cut off the claws and arms.
3. Cut the tail into cross-sections.
4. Split the head and thorax in half. The tomalley and coral (if present) can be removed and saved for further use. The head and legs may be added to the recipe for flavor, but there is very little meat in them and they are typically discarded.
5. Crack the claws with a firm blow, using the back of a chef's knife.

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2. With the fingers of the same hand, squeeze and pull the blade of the clam knife between the clamshells. Do not push on the knife handle with your other hand; you will not be able to control the knife if it slips and you can cut yourself.
3. Pull the knife between the shells until it cuts the muscle. Twist the knife to pry the shells apart. Slide the knife tip along the top shell and cut through the muscle. Twist the top shell, breaking it free at the hinge; discard it.
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3. Slide the knife along the top of the shell to release the oyster from the shell. Discard the top shell.
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1. Clean the mussel with a brush under cold running water to remove sand and grit.
2. Pull the beard away from the mussel with your fingers or a small pair of pliers.

~Procedure for Preparing Live Lobsters for Boiling~

A whole lobster can be cooked by plunging it into boiling water or court bouillon. If the lobster is to be broiled, it must be split lengthwise before cooking.

1. Place the live lobster on its back on a cutting board and pierce its head with the point of a chef's knife.
2. Then, in one smooth stroke, bring the knife down and cut through the body and tail without splitting it completely in half.

3. Use your hands to crack the lobsters back so that it lies flat. Crack the claws with the back of a chef's knife.
4. Cut through the tail and curl each half of the tail to the side. Remove and discard the stomach. The tomalley (the olive-green liver) and, if present, the coral (the roe) can be removed and saved for a sauce or other preparation

Various Cooking Methods. Fish and shellfish can be prepared by the dry-heat cooking methods of broiling and grilling, roasting (baking), sautéing, pan-frying and deep-frying , as well as the moist-heat cooking methods of steaming, poaching and simmering.

Determining Doneness

Unlike most meats and poultry, nearly all fish and shellfish are inherently tender and should be cooked just until done. Indeed, overcooking is the most common mistake made when preparing fish and shellfish. The Canadian Department of Fisheries recommends that all fish be cooked 10 minutes for every inch (2.5 centimeters) of thickness, regardless of cooking method. Although this may be a good general policy, variables such as the type and the form of fish and the exact cooking method used suggest that one or more of the following methods of determining doneness are more appropriate for professional food service operations:

- ✓ **Translucent flesh becomes opaque** -The raw flesh of most fish and shellfish appears somewhat translucent. As the proteins coagulate during cooking, the flesh becomes opaque.
- ✓ **Flesh becomes firm** - The flesh of most fish and shellfish firms as it cooks. Doneness can be tested by judging the resistance of the flesh when pressed with a finger. Raw or undercooked fish or shellfish will be mushy and soft. As it cooks, the flesh offers more resistance and springs back quickly.
- ✓ **Flesh separates from the bones easily** - The flesh of raw fish remains firmly attached to the bones. As the fish cooks, the flesh and bones separate easily.
- ✓ **Flesh begins to flake** - Fish flesh consists of short muscle fibers separated by thin connective tissue. As the fish cooks, the connective tissue breaks down and the groups of muscle fibers begin to flake, that is, separate from one another. Fish is done when the flesh begins to flake. If the flesh flakes easily, the fish will be overdone and dry.

Remember, fish and shellfish are subject to carryover cooking. Because they cook quickly and at low temperatures, it is better to undercook fish and shell- fish and allow carryover cooking or residual heat to finish the cooking process.

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## DRY-HEAT COOKING METHODS

Dry-heat cooking methods are those that do not require additional moisture at any time during the cooking process. The dry-heat cooking methods used with fish and shellfish are broiling and grilling, roasting (usually referred to as baking when used with fish and shellfish), sautéing, pan-frying and deep-frying.

### *Broiling and Grilling*

After brushing with oil or butter, fish can be grilled directly on the grate or placed on a heated platter under the broiler. Broiled or grilled fish should have a lightly charred surface and a slightly smoky flavor as a result of the intense radiant heat of the broiler or grill. The interior should be moist and juicy. Broiled or grilled shellfish meat should be moist and tender with only slight coloration from the grill or broiler.

### **Selecting Fish and Shellfish to Broil or Grill**

Nearly all types of fish and shellfish can be successfully broiled or grilled. Salmon, trout, swordfish and other oily fish are especially well suited to grilling, as are lean fish such as bass and snapper. Fillets of lean flatfish with delicate textures, such as flounder and sole, are better broiled. They should be placed on a preheated broiling (sizzler) platter before being placed under the broiler.

Oysters and clams are often broiled on the half shell with flavored butters, bread crumbs or other garnishes and served sizzling hot. Squid can be stuffed, secured with a tooth pick and broiled or grilled. Brushed with butter, split lobsters, king crabs and snow crabs are often broiled or grilled. Whole lobsters can be split and broiled or grilled, or their tails can be removed, split and cooked separately. Large crab legs can also be split and broiled or grilled. Shrimp and scallops are often broiled in flavored butters or grilled on skewers for easy handling.

### **Seasoning Fish and Shellfish to Be Broiled or Grilled**

- All fish should be brushed lightly with butter or oil before being placed on the grill or under the broiler. The butter or oil prevents sticking and helps leaner fish retain moisture.
- For most fish, a simple seasoning of salt and pepper suffices.
- Most fish do respond well to marinades, especially those made with white wine and lemon juice. Because most fish are delicately flavored, they should be marinated for only a brief time. (Even marinated fish should be brushed with butter or oil before cooking.) Herbs should be avoided because they will burn from the intense heat of the broiler or grill.

- Clams, oysters and other shellfish that are stuffed or cooked with butters, vegetables, bacon or other accompaniments or garnishes gain flavor from these ingredients.
- Be careful, however, not to overpower the delicate flavors of the shellfish by adding too many strong flavorings.

### **Accompaniments to Broiled and Grilled Fish and Shellfish**

Lemon wedges are the traditional accompaniment to broiled or grilled fish and shellfish. They can be served with sauces made separately. Butter sauces such as a *beurre blanc* are popular, as their richness complements the lean fish. Vegetable coulis are a good choice for a healthier, lower-fat accompaniment. If the item is cooked on a broiler platter with a seasoned butter, it is often served with that butter. Almost any side dish goes well with broiled or grilled fish or shellfish. Fried or boiled potatoes, pasta and rice are all good choices. Grilled vegetables are a natural choice.

### **~Procedure for Broiling or Grilling Fish and Shellfish~**

All fish is delicate and must be carefully handled to achieve an attractive finished product. When broiling whole fish or fillets with their skin still on, score the skin by making several diagonal slashes approximately  $\frac{1}{4}$  inch (6 millimeters) deep at even intervals. This prevents the fish from curling during cooking, promotes even cooking and creates a more attractive finished product. Be especially careful not to overcook the item. It should be served as hot as possible as soon as it is removed from the broiler or grill.

1. Heat the broiler or grill.
2. Use a wire brush to remove any charred or burnt particles that may be stuck to the broiler or grill grate. The grate can be wiped with a lightly oiled towel to remove any remaining particles and help season it.
3. Prepare the item to be broiled or grilled. For example, cut the fish into steaks or tranches of even thickness; split the lobster, peel and/or skewer the shrimp. Season or marinate the item as desired. Brush the item with oil or butter.
4. Place the item on a grill, presentation side down. If using a broiler, place the item directly on the grate or on a preheated broiler platter. Tender fish are usually broiled presentation side up on a broiler platter.

### ***Baking***

The terms baking and roasting are used interchangeably when applied to fish and shellfish. One disadvantage of baking fish is that the short baking time does not allow the surface of the fish to caramelize. To help correct this problem, fish can be browned in a *sauté* pan with a small amount

of oil to achieve the added flavor and appearance of a browned surface, and then finished in an oven.

### **Selecting Fish and Shellfish to Bake**

Fatty fish produce the best-baked fish. Fish fillets and steaks are the best market forms to bake, as they cook quickly and evenly and are easily portioned. Although lean fish can be baked, it tends to become dry and must be basted often.

### **Seasoning Fish and Shellfish for Baking**

The most popular seasonings for baked fish are lemon, butter, salt and pepper. Fish can also be marinated before baking for added flavor. Baked fish usually depend on the accompanying sauce for much of their flavor.

Shellfish are often stuffed or mixed with other ingredients before baking. For example, raw oysters on the half shell can be topped with spinach, watercress and Pernod (oysters Rockefeller) and baked. Shrimp are often butterflied, stuffed and baked; lobsters are split, stuffed, and baked. Many food service operations remove clams from their shells; mix them with breadcrumbs, seasonings or other ingredients; refill the shells and bake the mixture.

### **~Procedure for Baking Fish and Shellfish~**

1. Portion the fish or shellfish and arrange on a well-oiled or buttered pan, presentation side up.
2. Season as desired and brush the surface of the fish or shellfish generously with melted butter; add garnishes or flavorings as desired or directed in the recipe.
3. Place the pan in a preheated oven at approximately 400°F (200°C).
4. Baste periodically during the cooking process (more often if the fish is lean). Remove from the oven when the fish is slightly underdone.

### ***Sautéing***

Sautéing is a very popular cooking method for fish and shellfish. It lightly caramelizes the food's surface, giving it additional flavor. Typically, other ingredients such as garlic, onions, vegetables, wine and lemon juice are added to the fond to make a sauce.

### **Selecting Fish and Shellfish to Sauté**

Both fatty and lean fish may be sautéed. Flatfish are sometimes dressed and sautéed whole, as are small round fish such as trout. Larger fish such as salmon can be cut into steaks or filleted and cut into tranches. The portions should be relatively uniform in size and thickness and fairly thin to

promote even cooking. Although clams, mussels and oysters are not often sautéed, scallops and crustaceans are popular sauté items.

### **Seasoning Fish and Shellfish to Be Sautéed**

Many types of fish - especially sole, flounder and other delicate, lean fish fillets - are dredged in plain or seasoned flour before sautéing. Seasoned butter is used to sauté some items, such as scampi-style shrimp. These items derive their flavor from the butter; additional seasonings should not be necessary.

### **Cooking Temperatures**

The sauté pan and cooking fat must be hot before the fish or shellfish are added. Do not add too much fish or shellfish to the pan at one time, or the pan and fat will cool, letting the foods simmer in their own juices. Thin slices and small pieces of fish and shellfish require a short cooking time, so use high temperatures in order to caramelize their surfaces without overcooking. Large, thick pieces of fish or shellfish being cooked in the shell may require slightly lower cooking temperatures to ensure that they are cooked without overbrowning their surfaces.

### **Accompaniments to Sautéed Fish and Shellfish**

Sautéed fish and shellfish are nearly always served with a sauce made directly in the sauté pan. This sauce may be as simple as browned butter (beurre noisette) or a complicated sauce flavored with the fond. In some cases, seasoned butter is used to sauté the fish or shellfish and the butter is then served with the main item. Mildly flavored rice and pasta are good choices to serve with sautéed fish or shellfish.

### **~Procedure for Sautéing Fish and Shellfish~**

1. Cut or portion the fish or shellfish.
2. Season the item and dredge in seasoned flour if desired.
3. Heat a suitable sauté pan over moderate heat; add enough oil or clarified butter to cover the bottom to a depth of about 1/s inch (3 millimeters).
4. Add the fish or shellfish to the pan (fish should be placed presentation side down); cook until done, turning once halfway through the cooking process. Add other foods as called for in the recipe.
5. Remove the fish or shellfish. If a sauce is to be made in the sauté pan, follow the appropriate procedures.

## ***Pan-frying***

Pan-frying is very similar to sautéing, but it uses more fat to cook the main item. Pan-fried fish is always coated with flour, batter or breading to help seal the surface and prevent the flesh from coming into direct contact with the cooking fat. Properly prepared pan-fried fish and shellfish should be moist and tender with a crisp surface. If battered or breaded, the coating should be intact with no breaks.

### **Selecting Fish and Shellfish to Pan-Fry**

Both fatty and lean fish may be pan-fried. Trout and other small fish are ideal for pan-frying, as are portioned fillets of lean fish such as halibut. Pan-fried fish and shellfish should be uniform in size and relatively thin so that they cook quickly and evenly.

### **Seasoning Fish and Shellfish to Be Pan-Fried**

Although fish and shellfish can be marinated or seasoned directly, it is more common to season the flour, batter or breading that will coat them. Batters, for example, can contain cheese, and breading can contain nuts and other ingredients to add different flavors to the fish or shellfish. Additional seasonings come from sauces and other accompaniments served with the pan-fried fish or shellfish.

### **Cooking Temperatures**

The fat should always be hot before the fish or shellfish are added. Breaded or battered fish fillets cook very quickly, and the fat should be hot enough to brown the coating without overcooking the interior. Whole pan-fried fish take longer to cook and therefore require a slightly lower cooking temperature so that the surface does not become too dark before the interior is cooked.

### **Accompaniments to Pan-Fried Fish and Shellfish**

Lemon wedges are the classic accompaniment to pan-fried fish and shellfish. Sauces that accompany pan-fried items are made separately. Mayonnaise-based sauces such as Tartar Sauce and Remoulade Sauce are especially popular; rich wine-based sauces should be avoided. Vegetable coulis, such as tomato, also complement many pan-fried items.

### ***~Procedure for Pan-Frying Fish and Shellfish~***

1. Heat enough clarified butter or oil in a heavy sauté pan so that it will come one-third to halfway up the side of the item. The fat should be at a temperature between 325°F and 350°F (163°C and 177°C).
2. Add the floured, breaded or battered item to the pan, being careful not to splash the hot fat. Cook until done, turning once halfway through the cooking process.
3. Remove the food and drain on absorbent paper.

4. Serve it promptly with an appropriate sauce.

### ***Deep-frying***

Deep -frying is the process of cooking foods by submerging them in hot fat. Typically, fish or shellfish are breaded or battered before deep-frying. Alternatively, they can be formed into croquettes or fritters. Properly deep-fried fish and shell-fish should be moist and tender, not greasy or tough. Their coating should be crispy and golden brown.

### **Selecting Fish and Shellfish to Deep-Fry**

Whole small fish and fillets of lean fish such as catfish or halibut are excellent for deep -frying. The fillets should be of uniform size and relatively thin so that they cook quickly and evenly. Fatty fish, such as salmon, are ideal for croquettes. Peeled shrimp and shucked mollusks, especially clams and oysters, can be breaded, battered or formed into fritters and deep-fried. Deep-fried breaded or battered sliced squid or octopus served with a dipping sauce makes an excellent hors d'oeuvre.

### **Seasoning Fish and Shellfish to Be Deep-Fried**

Typically, seasonings used for deep-fried fish or shellfish are added to the breading or batter, although salt and pepper should be added after frying. Additional flavors come from sauces or accompaniments.

### **~Procedure for Deep-Frying Fish and Shellfish~**

1. Shuck, peel, cut, trim or otherwise prepare the fish or shellfish to be deep-fried. Season, bread or batter it, as desired.
2. Heat the fat to the desired temperature, usually around 350°F (177°C).
3. Breaded or battered fish or shellfish cook quickly and the fat must be hot enough to cook the food's interior without burning its surface.
4. Carefully place the food in the hot fat using either the basket method or the swimming method.
5. Deep-fry the fish or shellfish until done. Doneness is usually determined by color, timing or sampling.
6. Remove the deep-fried food from the fat and hold it over the fryer, allowing the excess fat to drain off. Transfer the food to a hotel pan either lined with absorbent paper or fitted with a rack. Season with salt, if desired.
7. If the deep-fried fish or shellfish is to be held for later service, place it under a heat lamp.

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MOIST-HEAT COOKING METHODS

Fish and shellfish lend themselves well to moist-heat cooking methods, especially steaming, poaching and simmering. Steaming best preserves the food's natural flavors and cooks without adding fat. Poaching is also popular, especially for fish. Poached fish can be served hot or cold, whole or as steaks, fillets or portions. Boiling, which is actually simmering, is most often associated with crustaceans.

Steaming

Steaming is a very natural way to cook fish and shellfish without adding fats. Fish are steamed by suspending them over a small amount of boiling liquid in a covered pan. The steam trapped in the pan gently cooks the food while preserving its natural flavors and most nutrients. The liquid used to steam fish and shellfish can be water or a court bouillon with herbs, spices, aromatics or wine added to infuse the item with additional flavors. Mussels and clams can be steamed by placing them directly in a pan, adding a small amount of wine or other liquid and covering them. Their shells will hold them above the liquid as they cook. Fish and shellfish can also be steamed by wrapping them in parchment paper together with herbs, vegetables, butters or sauces as accompaniments and baking them in a hot oven. This method of steaming is called **en papillote**.

Steamed fish and shellfish should be moist and tender. They should have clean and delicate flavors. Any accompaniments or sauces should complement the main item without masking its flavor. Fish and shellfish cooked en papillote should be served piping hot so that the aromatic steam trapped by the paper escapes as the paper is cut open tableside.

Selecting Fish and Shellfish to Steam

Mollusks (for example, clams and mussels), fatty fish (for example, salmon or sea bass) and lean fish (for example, sole) all produce good results when steamed. The portions should be of uniform thickness and no more than 1 inch (2.5 centimeters) thick to promote even cooking.

Seasoning Fish and Shellfish to Be Steamed

Steamed fish and shellfish rely heavily on their natural flavors and often require very little seasoning. Nevertheless, salt, pepper, herbs and spices can be applied directly to the raw food before steaming. Flavored liquids used to steam fish and shellfish will contribute additional flavors. If the liquid is served with the fish or shellfish as a broth or used to make a sauce to accompany the item, it is especially important that the liquid be well seasoned. Lemons, limes and other fruits or vegetables can also be cooked with the fish or shellfish to add flavors. Clams

and mussels often do not require additional salt, as the liquor released when they open during cooking is sufficiently salty.

Accompaniments to Steamed Fish and Shellfish

Steamed fish and shellfish are popular partly because they are low in fat. In keeping with this perception, a low or nonfat sauce or a simple squeeze of lemon and steamed fresh vegetables are good accompaniments. If fat is not a concern, then an emulsified butter sauce such as Beurre Blanc or Hollandaise may be a good choice.

Classic New England steamed clams are served with a portion of the steaming liquid; steamed mussels are served with a sauce that is created from the wine and other ingredients used to steam them.

~Steaming Procedure for Fish and Shellfish~

1. Portion the fish to an appropriate size. Clean the shellfish.
2. Prepare the cooking liquid. Add seasoning and flavoring ingredients as desired and bring to a boil.
3. Place the fish or shellfish in the steamer on a rack or in a perforated pan and cover tightly.
4. Steam the fish or shellfish until done.
5. Serve the fish or shellfish immediately with the steaming liquid or an appropriate sauce.
- 6.

Simmering

"Boiled" lobster, crab, and shrimp are not actually boiled; rather, they are cooked whole in their shells by simmering. Although they are not as delicate as some fish, these crustaceans can become tough and are easily overcooked if the cooking liquid is allowed to boil.

Selecting Shellfish to Simmer

Lobsters, crabs, and shrimp are generally cooked by simmering. Their hard shells protect their delicate flesh during the cooking process.

Seasoning Shellfish to Be Simmered

The shellfish should not be seasoned prior to cooking. You achieve the best flavor by cooking in a seasoned or flavored liquid, typically salted water or court bouillon. A sachet of pickling spice or Old Bay seasoning is sometimes used for additional flavor. In the Bayou region of Louisiana, there are numerous seasoning other than Old Bay.

Determining Doneness

Timing is the best method for determining the doneness of simmered shellfish. This varies depending on the size of the shellfish, and how quickly the liquid returns to a simmer after the

shellfish is added. Shrimp cook in as little as 3 to 5 minutes; crabs cook in 5 to 10 minutes; and it can take as little as 6 to 8 minutes for a 1-pound (450-gram) lobster to cook and 15 to 20 minutes for a 2 1/2-pound (1.1-kilogram) lobster.

Accompaniments to Simmered Shellfish

The standard accompaniments to simmered shellfish are lemon wedges and melted butter. If the shellfish are to be eaten cold, the traditional sauce is a tomato-based cocktail sauce. Nearly any type of vegetable or starch goes well with simmered shellfish, the most common being fresh corn on the cob and boiled potatoes.

~Procedure for Simmering or Boiling Shellfish~

1. Bring court bouillon or water to a boil.
2. Add the shellfish to the liquid. Bring the liquid back to a boil and reduce to a simmer. (Whenever an item is added to boiling water, it lowers the water's temperature. The greater the amount of water, however, the faster it will return to a boil. So to accelerate the time within which the water returns to a boil after the shellfish is added, use as much water as possible.)
3. Cook until done.
4. Remove the shellfish from the liquid and serve immediately, or cool by dropping them in ice water if they are to be eaten cold.

As consumers' increase health awareness, more and more food service operations are expanding their selections of fish and shellfish. Their task is aided by the tremendous variety of high-quality fish and shellfish now available. A variety of dry-heat and moist-heat cooking methods can be used with these products, and a variety of sauces and accompaniments can be served with them. Regardless of how they are served, care and attention are required in order to select, store and avoid overcooking fish and shellfish.

Classroom Preparation Assignment

Topic 13

Shellfish Identification and Fabrication

1. Shellfish are _____ with shells or carapaces.
 2. Because their cooking times are generally shorter and their taste is more delicate than meat and poultry, special attention must be given to shellfish to
 3. Name three types of mollusks.
 4. Name three types of crustaceans.
 5. _____ are univalve land animals that share characteristics with their marine cousins.
 6. Clams, cockles, mussels, and oysters are classified as _____.
 7. Name two cephalopods.
 8. Name four types of crustacean
 9. List four good ways to determine doneness in fish and shellfish according to the text.
 10. The section on "Simmering" seems to conflict with Cajun Boiling methodology. How so?
-

Topic Fourteen

Sushi Identification and Fabrication



Time and time again students comment that this was a favorite day for them in the course, so it may be fitting that this is the last lecture a lab before your final project of the offal presentation day before deep cleaning. We will cover the basics of sushi making along with miso soup, sushi rice, and fabrication of Nigiri sushi, rolls, and Sashimi. If you are not a raw fish fan, please understand that sushi can be vegetarian or even cooked or filled with grilled or tempura fried seafood. There is a sushi for everyone; find what fits your taste or create it.

Sushi

In Japanese cuisine, sushi (寿司, 鮓, 鮓) is vinegared rice, usually topped with other ingredients including fish (cooked or uncooked) and vegetables. Outside of Japan, sushi is sometimes misunderstood to mean the raw fish by itself, or even any fresh raw-seafood dishes. In Japan, sliced raw fish alone is called sashimi and is distinct from sushi, as sashimi is the raw fish component, not the rice component. The word sushi itself comes from an outdated grammatical form of a word that is no longer used in other contexts; literally, sushi means “it’s sour.”

Sushi must contain rice, typically contains nori (and sometimes seaweed), and virtually always includes fillings or toppings such as of various types, such as seafood, chicken, tuna etc., the possibilities of which are endless. Similar to Western appetizers (although sushi is often intended to be the main course), sushi should be served in a manner that will allow eating by hand, usually in a bite or two. Many types of sushi are individually made by the cook to the appropriate size or are cut by the cook to this size before serving. Although sushi may be prepared in a wrap or roll format prior to serving, traditional ingredients lack the structural strength needed to allow them to be eaten by hand as an entire roll or wrap.

Sushi, in its simplest forms, is made by first cooking rice, then cooling it, molding by it hand or in a mold and adding a topping, or wrapping the rice in nori and adding fillings to make a roll, using a bamboo mat to help, which is then cut into smaller pieces. Usually served cool and with soy sauce, sliced ginger, and wasabi.

Sushi can be eaten as served by the cook or dipped into (or, using sliced ginger as a ‘brush’, wiped with) soy sauce and then eaten, with additional wasabi added by the brave. As a general rule, it is always appropriate to eat sushi by hand, unless it is obvious that you cannot avoid getting rice or other ingredients stuck to your fingers, in which case chopsticks should be used.

Much care is put into the creation of the dish and the many methods of preparing the food indicate the importance of appearance to the educated consumer.

History

Beginning as a method of pickling fish centuries ago, sushi has evolved into an artful, unique dining experience. In its earliest form, fish was placed between two wads of rice, producing a moderately complex chemical reaction as the fish fermented, helping to preserve it. Sometime between the 14th and 16th centuries, rice vinegar started to be added to the rice to help speed up the process which took several months. Around this time the rice also started to be consumed with the fish it was used to preserve. **Nori** (red algae seaweed paper) was added about this period as a way to keep one’s fingers from getting sticky, thus creating the first ancestor of modern ‘**makizushi**’, or rolled sushi.

Sometime in the mid to late 18th century, a restaurant in Edo (modern Tokyo) started serving sushi rice alone with thinly sliced fresh fish pressed into it. This was the start of Edo-Mae sushi, which is also known as ‘nigirizushi’, or pressed sushi.

Sometime after this, a chef took this one step further and eliminated the sushi rice all together: the birth of sashimi. It is important to note that sashimi specifically refers to thinly sliced raw or mostly raw fish and shellfish.

It is hard to tell when exactly the wasabi and pickled ginger were added, but it is probable they came in with the Edo-Mae sushi, as this was when the focus of sushi became enjoying the taste of the exceedingly fresh fish, and the condiments heighten the experience.

Sushi types include **makizushi**, **nigirizushi**, **oshizushi**, and **inarizushi**.

Makizushi

Makizushi (rolled sushi), or maki for short, is the kind that is most common to North American consumers (see **California Rolls**) as it is basically sushi layered on top of nori, rolled into a tube, and cut into thick slices. Easy to make and even easier to mass produce, it has found a wide proliferation as a new form of fast food, but still manages to be found in Japanese restaurants that still respect the tradition.

Nigirizushi

Nigirizushi (hand formed sushi), or nigiri for short, is, as stated above, a hand-formed small bed of rice with an ingredient on top (ranging from tuna or salmon to eel or egg). Nigiri sushi that is served without the rice is called sashimi. Gunkanmaki (battleship roll or boat sushi) is a nigirizushi where an oval piece of sushi rice is surrounded by nori and topped with a topping such as fish eggs.

Oshizushi

Oshizushi (pressed sushi) is similar to nigirizushi but it is formed by pressing with the aid of an oshibako, a wooden mold. Generally, the topping is placed in the oshibako first, the rice is added on top, and then the combination is pressed together with the oshibako top or lid. After pressing, the sushi is removed and cut to serving sizes.

Inarizushi

Inarizushi (stuffed sushi) is generally a pocket or pouch containing the rice and other ingredients. Materials used to make the pocket include tofu, bean curd, egg, and cabbage leaves.

Sashimi

Sashimi (basically sliced raw seafood, mostly fish without any rice) is often the most artistic form, with thin slices of fish and shellfish being formed into a range of different shapes, especially flowers. While technically not sushi, sashimi is often grouped together with the different types of sushi.

Saikuzushi

Saikuzushi is an artistic type of sushi, which makes a beautiful image. It is quite difficult to make this, and also quite expensive when bought. Rice is tinted with different colors and later sliced to make an image.

Chirashizushi

Chirashizushi, is scattered sushi with rice in a box or bowl and seaweed on top. Different kinds of seafood and fish are placed on top, including octopus, squid, tuna, alongside with chopped

cucumbers and green onion. Chirashizushi has two main regional types, the version of Tokyo, and the Osaka Version.

Edomae, or **Temakizushi**, is one of the most common types of sushi, with rice and fish rolled up in seaweed. Crab, octopus, tuna, shrimp, and several other types of seafood is rolled up inside the rice. It is even found in convenience stores in Japan.

Eating Sushi

An authentic sushi-eating experience can include miso soup, makizushi (sushi rolls), sashimi (pieces of fish with no rice), nigirizushi and garnishes of wasabi, soy sauce and pickled ginger. Hot, fresh, green tea is an excellent beverage to drink with your meal, as is beer or plain water. While sake can be consumed with sushi, because it is made from rice it is considered to be too much rice in one meal.

In Japan, sushi chefs will apply a small amount of wasabi to the appropriate types of sushi during preparation. For example, sushi that features its own unique sauce will be prepared sans wasabi so as not to compromise the flavor. Western sushi chefs may do this, but some may not apply wasabi to any sushi.

Sushi can be eaten with chopsticks or by hand; nigiri sushi in particular may be eaten by hand because the rice is packed lightly and may fall apart if eaten with chopsticks.

Start your meal with simple miso soup but do not spend too much time on any one item as this is the proper **Japanese etiquette**. Instead, rotate through your meal to appreciate the quality of each aspect. Many people start with a mild sushi, such as tamago (a sweet, cold omelet on rice), and end with a stronger taste at the end of the meal, like a darker fish. Between different items it is recommended that a piece of pickled ginger be eaten to cleanse the palate and ensure that none of the subtle flavors of the sushi is missed.

There are different types of seafood used for sushi, and the most common ones are tuna, salmon, squid and octopus. Using expensive seaweed makes sushi taste much better. Expensive seaweed is darker in color, and is less likely to break when folded or rolled. Cheap seaweed is usually greenish in color. The type of soy sauce (shoyu) used also affects the taste of the sushi; the most commonly used brands are Kikkoman and Yamasa. Many people like to mix wasabi, which is a green colored, spicy condiment with their shoyu, which makes it quite spicy and wakening.

Condiments

Sushi is generally served with

- Wasabi
- Green horseradish (a cheap wasabi substitute) gari (pickled ginger)
- Soy sauce
- Kabayaki sauce (eel sauce) (often served on some sushi, may be used for dipping instead of soy sauce)

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Sushi / Sushi Rice

Sushi rice, termed *sushi meshi* or *shari* in Japanese, is a key ingredient for sushi and a staple of Japanese cooking. It consists of short-grain rice dressed with seasoned vinegar called *sushisu*. The rice is then cooled and dried for easy manipulation and to give a glistening appearance.

Ingredients

- 300g of uncooked, washed, short-grain Japanese rice
- (The Japanese measure their uncooked rice using a measurement called a Gō. This is roughly equivalent to 150 grams when used to measure Japanese rice. One Gō is also the standard size of a rice cooker's measuring cup)
- 400 mL of water
- 1 small sheet of Kombu (optional)
- 1 metric tablespoon (15 mL) of Sake (optional)
-

Sushisu (Seasoned rice vinegar dressing):

- 3 metric tablespoons (45 mL) of rice vinegar
- 1 to 2 metric tablespoons (12 to 24 g) of sugar (depending on how sweet you prefer it) 1 to 1.5 metric teaspoons of sea salt

Utencils

Rice cooker, **Hangari** (rice barrel), optional **Shamoji** (rice paddle), optional **Fukin** (cloth), optional

Procedure

1. About 30 minutes before starting, fill the *hangiri* with water and let it stand. The water saturates the wood, which prevents the rice from sticking to it.
2. Make the sushisu
3. Mix the vinegar, sugar, and salt.
4. Heat the mixture in a sauce pan until everything is dissolved, but do not boil.
5. Set aside to cool.
6. Cook the rice
7. Rinse the rice. Put the rice in the cooking pot, half filled with cold water, and swirl it around with your hand. The water will turn chalky white. Carefully drain off the water, and repeat the process several times, until the water remains clear.
8. Allow the rice to stand for 30 minutes. Some recipes say the rice should remain in the cooking pot submerged in its cooking water; others say to transfer it temporarily to a colander to drain.
9. Add an 8cm-sized sheet of *Kombu* to the cooking pot, and the sake if you are using it.

10. Boil the water in the cooking pot.
11. Remove the **Kombu** from the cooking pot just as the water boils, and reduce the heat.
12. Simmer the water and rice in the cooking pot for 20 minutes.
13. Turn off the heat but do **not** remove cover from the cooking pot for 10 minutes (no peeking).
14. **Note:** A rice-cooker is often used instead of a cooking pot; these generally produce good, consistent results. The manufacturer's directions will generally be similar to the above.
15. Add the dressing to the rice. The rice and sushisu should be mixed immediately after the rice is finished cooking with sushisu at room temperature.
16. Transfer the rice from the cooking pot to the hangiri; if you do not have one, use a large bowl or cookie sheet.
17. Cut the sushisu gently into rice with the paddle, trying not to break the kernels. (For Western chefs: this "cutting" motion is similar to the cut-and-fold used for gentle treatment of egg whites.) When finished, the rice is evenly coated with the dressing, giving it a shiny appearance.
18. Cover the rice with a cloth for a couple of minutes so the dressing is absorbed.
19. Cool the rice to body temperature by fanning it, while continuing to cut it with the spatula. A traditional hand fan or modern battery-powered fan may be used.

Note: Some sushi chefs prefer natural cooling, rather than fanning, and instead let the rice rest in the hangiri for fifteen minutes, then re-cut the rice, and continue with this process until the rice is cool.

Hangiri

In Japanese cuisine, a **hangiri** (半切 or 飯切), also known as **handai** (飯台, a rice table or rice bowl) or **sushi oke**, is a round, flat-bottomed wooden tub or barrel used in the final steps of preparing rice for sushi.[1] Traditional hangiri are made from cypress wood bound with two copper bands. They range in diameter from about 30 cm (1 ft.) for use at home, to 1 meter (3 feet) for use in a restaurant.

The hangiri and a **shamoji** wooden paddle are used to dress and to cool the rice. After cooking, the rice is transferred to the hangiri where it is tossed with a dressing made of rice vinegar, sugar, and salt. When the mixing is complete, it is covered with a cloth (fukin) and allowed to cool. A typical hangiri may cost two or three times as much as an expensive steel cooking pot.

Shamoji

A **shamoji** (杓文字, しやもじ) or rice paddle is a large flat spoon used in East Asian cuisine. It is used to stir and to serve rice, and to mix vinegar into the rice for sushi. Shamoji are traditionally made from bamboo, wood, or lacquer, and nowadays often from plastic. The shamoji is dipped in water frequently during use to prevent rice from sticking to it. Some expensive plastic shamoji have non-stick surfaces. Metal is rarely used, as this is more likely to cut rice grains or to damage the hangiri wooden tub traditionally used for mixing.

Modern rice cookers may include a shamoji in the box, usually made of white plastic. Shamoji are also used to crush vegetables, such as garlic and cucumbers, as cleavers are used in Western cuisine. The shamoji has also been a symbol of unity between the mother and wife in Japanese society. In one tradition, it was passed down from one generation to the next to symbolize the family duties that were handed down.

References

1. 杓文字（しゃもじ） - 語源由来辞典 (http://gogen-allguide.com/si/sy_amoji.html)
2. “Contemporary Japan: Culture & Society” (http://afe.easia.columbia.edu/at_japan_soc/common/all.htm#society). 2004.
3. . Omae, Kinjiro (1994). The Book of Sushi. Kodansha International. ISBN 9784770019547.
4. Retrieved from <https://en.wikipedia.org/w/index.php?title=Hangiri&oldid=873650172>
5. “https://en.wikibooks.org/w/index.php?title=Cookbook:Sushi/Sushi_Rice&oldid=2694044”

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Hangiri - Wiki A hangiri. This example is 41 cm (16 inches) in diameter. media commons



Traditional Shamoji- Wikimediacommons

Sushi / Maki

Ingredients

- Sushi rice (all of it prepared directly beforehand)
- Fish/vegetables (this may consist of either raw/smoked salmon, tuna, etc or perhaps cucumber or avocado) Sheets of nori (red algae seaweed paper).
- You must also have a makisu or sushi roller (bamboo sticks strung together with string) Wasabi paste, powders should say how to make them into paste.
- Water
- Plastic wrap, if making inside-out rolls with rice on outside
- Sesame seeds, if making inside-out rolls with rice on outside (optional)

Instructions

1. Take the roller and place it on top of a cutting board. If making inside out rolls with rice on the outside, make sure your makisu (roller) is completely wrapped in a double layer of plastic wrap. This task is simple and effective in keeping rice from sticking to where it shouldn't and especially sanitation. Finally, put a sheet of nori shiny side down on top of the makisu. Lengthwise or longwise depends both on the roll and amount of ingredients are being rolled.
2. Dampen your hands before applying the rice. This will prevent clumping and the rice sticking to your hands, but may also make the rice less sticky, so don't go overboard. Grab the rice with one hand and put a fistful on the center of the nori. When spreading this, leave a 2 centimeter gap on the side parallel to the bamboo. As a general rule, if you can't see the nori through the rice, you have too much. A 6mm layer has been recommended.
3. If making an inside out roll, flip over the nori and rice quickly onto the makisu. So as the rice is now on the surface of the mat and the nori is facing you.
4. Next place the primary ingredients in a row in the middle. Then, slowly use the roller to push the nori against itself (rolling it away from you), using your thumbs and heels of hands for stability. Be careful when you reach the row of ingredients, making sure that it goes underneath the roll rather than just being pushed along.
5. When you reach the end of the nori sheet, use the roller to compact the roll a little, making sure the rice is making it all stick together. Trying to even out a bumpy roll is simple, and it's really just a matter of hand pressure. Don't squeeze too hard on the sides

and don't flatten the roll from the top. If you want to fix the ends of the roll, just poke about 1/2 an inch out from one side of mat and while gently holding it in place, press it with the heel of your hand a little.

6. Next remove the maki from the sushi roller, and put it on the cutting board below.
7. Before you cut, wet your knife every time to reduce sticking (don't do it sparingly this time). This can be done using a sink, a large bowl, or a large plastic cup. A knife with dimples supposedly works well for cutting sushi. Slice the rolls from the inside out, into sections of 5, 6, or 8 (depending on roll). Cutting from the inside first will ensure that all ingredients that shift towards the outside two pieces. For the rolls of 6 or 8, cut from the center, then put one roll behind the other, and cut each half in half. If you were making an inside-out roll, you may wish to put on a line of sesame seeds primarily for garnish.
8. Serve with soy sauce and something shallow for dipping. You may also want chopsticks, pickled ginger, and wasabi if culture allows. Sashimi, Miso soup, other sushi, or just general Japanese food is also often served alongside it. Green Tea is considered the drink of choice to have with sushi.

Guest Habits

Do not be surprised if someone asks for wasabi with their soy sauce. Although this might be rare or offensive in your culture, it is very common in North American and European cultures. Also, do not be surprised if someone eats it without chopsticks. This is also very common, this time in East Asia. Sushi was originally designed to be eaten that way, until someone discovered how yummy soy sauce made it taste, reducing its portability. It is a clean way to eat maki (not for other types of sushi); you don't need to eat them with a fork or chopsticks. This phenomenon is similar to some cultures eating pizza with their hands, others with a fork and knife. It can be seen as unnecessary and idiotic, two good ways to eat food, or the sanitary and polite way.

Common Sushi Rolls

- **California Roll:** avocado, crab meat or imitation crab, cucumber.
- **Tuna Roll:** Tuna, wrapped in rice and seaweed.

This same combination is used to make plain rolls with any other type of fish.

- **Spicy Tuna Roll:** Tuna, spicy sauce
(mixture of Japanese mayonnaise and sriracha)

- **Kamikaze Roll:** Tuna, **yellowtail**, spicy sauce
- **Philadelphia Roll:** Salmon (either raw or smoked), cream cheese Cucumber Roll: Sliced cucumber. Vegan.
- **Egg Roll:** Sliced Egg Yellow. Vegetarian.



Wasabi

Also known as Japanese horseradish (*Wasabia japonica*), this green root is prepared by being ground, dried, and made into a paste. It is used in Japanese cooking and is often served with sushi.

Since the plant is difficult to grow, most wasabi sold outside of Japan is just European horseradish with green coloring added.



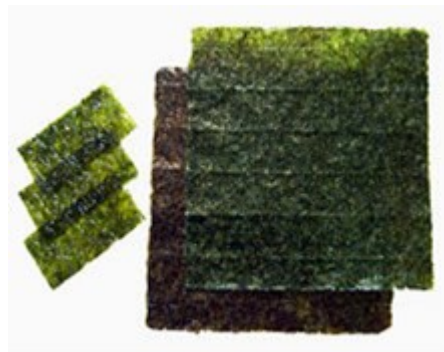
Wasabi

Wasabi (Japanese: 山葵 or 和佐比; scientific name *Wasabia japonica* (syn. *Cochlearia wasabi*, *Eutrema japonica*)) is a member of the cabbage family. Commonly known as Japanese horseradish, it grows naturally along stream beds in mountain river valleys in Japan. It is green and has an extremely strong flavor. Its hotness is different from chili pepper, which burns the tongue; wasabi's strong sensations shoot up one's sinus cavity instead. The historical purpose for wasabi is supposedly to kill the bacteria in the raw fish often used in sushi.

Edible Algae

Nori

Nori (海苔) is a Japanese term used to refer to edible varieties of algae in the various species of the red algae *Porphyra*, including most notably *P. yezoensis* and *P. tenera*. A few other algae are used as well, including some cyanobacteria. Nori is also commonly used to refer to the food products created from these so-called "sea vegetables". Finished products are made by a shredding and rack-drying process that resembles papermaking. Nori is commonly used as a wrap for Onigiri and Makizushi.



Nori

Nori is sometimes translated *laver* in English, but the term usually applies to plants of the genus *Porphyra* and not to the finished edible sheets of nori. The English term is in any case not well known, and in the United States, the term *nori* is more common.

Other edible algae commonly served in Japan include **wakame**, which is usually dried nori baked and seasoned with sweet soy sauce.

Classroom Preparation Assignment

Topic 14

Sushi

Name: _____ Date: _____

1. Sushi is a word that came from an outdated use meaning, _____.
2. Centuries ago sushi was _____ and layered between layers of rice.
3. As a general rule it is appropriate to eat sushi how?
4. Sometime in the late 18th century sushi chefs began to make sushi without rice or nori and called this?
5. The most commonly form of sushi consumed in North America is.
6. Name four components of an authentic sushi eating experience.
7. Rotating through the different components of a sushi meal is the way to show proper Japanese?
8. Americans often drink sake with sushi, however, green tea may be a better choice as sake is considered to be _____ rice.
9. When making sushi rice the addition of _____ adds umami flavor.
10. Nori is really an _____.

Topic Fifteen:
Final Offal Project Day

This is a team research project that will offer something for everyone on your team:

1. Write a paper about your chosen offal;
2. cook the offal on the project day and
3. present an entrée serving plate up and
4. a family platter for sampling.

Topic Sixteen:
Deep Clean

Today is a mandatory graded deep clean day.

*Cleanliness is vital to the preparation and consumption of food
from the cold kitchen element of food service.*

Notes:

Larousse Gastronomique, by Prosper Montagne (Ed.), Clarkson Potter, 2001. ISBN 0-609-60971-8.

Alford, Katherine (2001). *Caviar, Truffles, and Foie Gras*. Chronicle Books. ISBN 978-0-8118-2791-1.

Bett, Henry (2003). *Wanderings Among Words*. Kessinger Publishing. ISBN 978-0-7661-7792-5.

Davidson, Alan (1999). *The Oxford Companion to Food*. Oxford University Press. ISBN 978-0-19-211579-9.

Faas, Patrick (2002). *Around the Table of the Romans: Food and Feasting in Ancient Rome*. Palgrave Macmillan. ISBN 978-0-312-23958-9.

Giacosa, Ilaria Gozzini (1994). *A Taste of Ancient Rome*. University Of Chicago Press. ISBN 978-0-226-29032-4.

Ginor, Michael A. (1999). *Foie Gras: A Passion*. John Wiley & Sons. ISBN 978-0-471-29318-7. Langslow, David R. (2000). *Medical Latin in the Roman Empire*. Oxford University Press. ISBN 978-0-19-815279-8. Littré,

Maximilien Paul Emile (1863). "Histoire de la langue française: Études sur les origines, l'étymologie, la grammaire". Didier.

McGee, Harold (2004). *On Food and Cooking: The Science and Lore of the Kitchen*. Scribner. ISBN 978-0-684-80001-1.

Serventi, Silvano (1993). *La grande histoire du foie gras*. Flammarion. ISBN 978-2-08-200542-5..

Toussaint-Samat, Maguelonne (1994). *History of Food*. Blackwell Publishing Professional. ISBN 978-0-631-19497-2.

Walter, Henriette (2006). *French Inside Out: The French Language Past and Present*. Routledge. ISBN 978-0-415-07670-8.

"Sources of the world's meat supply in 2012". Retrieved August 26, 2018.

Card, Leslie E. (1961). *Poultry Production*. Lea & Febiger. ISBN 978-0-8121-1241-2.

Adler, Jerry; Lawler, Andrew (June 1, 2012). "How the Chicken Conquered the World". *Smithsonian Magazine*. Retrieved April 14, 2014.

Storey, A. A.; Athens, J. S.; Bryant, D.; Carson, M.; Emery, K.; et al. (2012). "Investigating the global dispersal of chickens in prehistory using ancient mitochondrial DNA signatures". *PLoS ONE*. 7(7): e39171. doi:10.1371/journal.pone.0039171. PMC 3405094. PMID 22848352.

"Information sheet: The Welfare of Farmed Ducks". RSPCA. July 1, 2012. Retrieved March 8, 2014.

Cherry, Peter; Morris, T. R. (2008). *Domestic Duck Production: Science and Practice*. CABI. pp. 1–7. ISBN 978-1-84593-441-5.

Dean, William F.; Sandhu, Tirath S. (2008). "Domestic ducks". Cornell University. Archived from the original on October 15, 2013. Retrieved February 15, 2014.

Buckland, R.; Guy, G. "Origins and Breeds of Domestic Geese". FAO Agriculture Department. Retrieved February 17, 2014.

Streit, Scott (2000). "White Chinese Goose". Bird Friends Of San Diego County. Retrieved February 17, 2014.

"CALU factsheet: Meat geese seasonal production" (PDF). June 1, 2009. Retrieved March 9, 2014.

Mo Hong'e (April 11, 2006). "China to boost foie gras production". China View. Archived from the original on June 2, 2007. Retrieved March 9, 2014.

"Welfare Aspects of the Production of Foie Gras in Ducks and Geese" (PDF). Report of the Scientific Committee on Animal Health and Animal Welfare. December 16, 1998. Archived from the original (PDF) on December 19, 2013. Retrieved March 9, 2014.

Jacob, Jacquie; Pescatore, Tony; Cantor, Austin. "Keeping Guinea fowl" (PDF). University of Kentucky. Retrieved March 9, 2014.

Bolla, Gerry (April 1, 2007). "Primefacts: Squab raising" (PDF). NSW Department of Primary Industries. ISSN 1832-6668. Retrieved March 9, 2014.

Smith, Andrew F. (2006). *The Turkey: An American Story*. University of Illinois Press. pp. 4–5, 17. ISBN 978-0-252-03163-2.

C. Michael Hogan. 2008. Wild turkey: *Meleagris gallopavo*, GlobalTwitcher.com, ed. N. L Stromberg Archived July 25, 2017, at the Wayback Machine

Viegas, Jennifer (February 1, 2010). "Native Americans First Tamed Turkeys 2,000 Years Ago". Retrieved February 19, 2014.

Pond, Wilson, G.; Bell, Alan, W. (eds.) (2010). *Turkeys: Behavior, Management and Well-Being*. Marcell Dekker. pp. 847–849. ISBN 0-8247-5496-4.

Bill, Joe (December 18, 2013). "Can turkey rule the roost all year round?" Your Shepway. Archived from the original on March 3, 2014. Retrieved March 3, 2014.

Institute of Laboratory Animal Resources (U.S.). Subcommittee on Avian Standards (1969). *Coturnix (Coturnix coturnix japonica): standards and guidelines for the breeding, care, and management of laboratory animals*. National Academies.

Roberts, Michael (1999). *Quail, Past and Present. Domestic Fowl Research*. pp. 11–18. ISBN 0-947870-12-1.

Mills, A. D.; Crawford, L. L.; Domjan, M.; Faure, J. M. (1997). "The Behavior of the Japanese or

Domestic Quail *Coturnix japonica*". *Neuroscience and Biobehavioral Reviews*. 21(3): 261–281. doi:10.1016/S0149-7634(96)00028-0.

Hubrecht, R.; Kirkwood, J. (2010). *The UFAW Handbook on the Care and Management of Laboratory and Other Research Animals*. John Wiley & Sons. pp. 655–674.

Coturnix (Coturnix coturnix japonica): standards and guidelines for the breeding, care, and management of laboratory animals. National Academy of Sciences. 1969. pp. 1–47.

Puigcerver, Manel; Vinyoles, Dolors; Rodríguez-Teijeiro, José Domingo (2007). "Does restocking with Japanese quail or hybrids affect native populations of common quail *Coturnix coturnix*?". *Biological Conservation*. 136 (4): 628–635. doi:10.1016/j.biocon.2007.01.007.

The New Encyclopædia, ed. Daniel Coit Gilman, Harry Thurston Peck and Frank Moore. (New York: Dodd, Mead & Company, 1903): Vol. XIII, 778.

William Makepeace Thackeray, *Vanity Fair*, Ch. 9.

Schwartzkoff, Louise (2 February 2010). "Books – The Fat Duck Cookbook by Heston Blumenthal".

Sydney Morning Herald (Book review). *Nation's Restaurant News*, 2004.

Serventi 1993, cover text. "The goose is getting fat Politically incorrect it may be, but foie gras is storming British menus.

Anwer Bati reports". *The Daily Telegraph*. London. 1 November 2003. Retrieved 2 May 2010.

World Food By Stephen Fallon, Michael Rothschild ISBN 1-86450-021-2, ISBN 978-1-86450-021-9 page 49

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GLOSSARY

a la - French for "in the manner or style of"; used in relation to a food, it designates a style of preparation or presentation.

a la carte - a menu on which each food and beverage is listed and priced separately; (2) foods cooked to order as opposed to foods cooked in advance and held for later service.

a la grecque - a preparation style in which vegetables are marinated in olive oil, lemon juice and herbs, then served cold.

a point - French term for cooking to the ideal degree of doneness; (2) when applied to meat, refers to cooking it medium rare.

acid - a substance that neutralizes a base (alkaline) in a liquid solution; foods such as citrus juice, vinegar and wine that have a sour or sharp flavor (most foods are slightly acidic); acids have a pH of less than 7.

acidulation - the browning of cut fruit caused by the reaction of an enzyme (polyphenol oxidase) with the phenolic compounds present in these fruits; this browning is often mistakenly attributed to exposure to oxygen.

additives (also adjuncts) - substances added to many foods to prevent spoilage or improve appearance, texture, flavor or nutritional value; they may be synthetic materials copied from nature (for example, sugar substitutes) or naturally occurring substances (for example, lecithin). Some food additives may cause allergic reactions in sensitive people.

adobo seasoning - a commercial spice blend; although several brands are available, most include dried chilies, Mexican oregano, cumin, black pepper, garlic powder and onion powder.

aerobic bacteria - those that thrive on oxygen.

aging - (1) the period during which freshly killed meat is allowed to rest so that the effects of rigor mortis dissipate; (2) the period during which freshly milled flour is allowed to rest so that it will whiten and produce less sticky doughs; the aging of flour can be chemically accelerated.

airline breast - a boneless chicken breast with the first wing bone attached.

alkali - also known as a base, any substance with a pH higher than 7; baking soda is one of the few alkaline foods.

allumettes - a matchstick cut of 1/8 inch X 1/8 inch X 2 inches (3 millimeters X 3 millimeters X 5 centimeters) usually used for potatoes; (2) a strip of puff pastry with a sweet or savory filling.

amino acid - the basic molecular component of proteins; each of the approximately two dozen amino acids contains oxygen, hydrogen, carbon and nitrogen atoms.

anadromous - describes a fish that migrates from a saltwater habitat to spawn in fresh water.

anaerobic bacteria - those that are able to live and grow without the presence of oxygen.

andouille - a very spicy smoked pork sausage, popular in Cajun cuisine.

angus beef, Certified - a brand created in 1978 to distinguish the highest-quality beef produced from descendants of the black, hornless Angus cattle of Scotland.

anterior - at or toward the front of an object or place; opposite of posterior.

appetizers - also known as first courses, usually small portions of hot or cold foods intended to whet the appetite in anticipation of the more substantial courses to follow.

aquafarming - also known as aquaculture, the business, science and practice of raising large quantities of fish and shellfish in tanks, ponds or ocean pens.

aroma - the sensations, as interpreted by the brain, of what we detect when a substance comes in contact with sense receptors in the nose.

aromatic - a food added to enhance the natural aromas of another food; aromatics include most flavorings, such as herbs and spices, as well as some vegetables.

aspic; aspic jelly - a clear jelly usually made from a clarified stock thickened with gelatin; used to coat foods, especially charcuterie items, and for garnish.

as purchased (A.P.) - the condition or cost of an item as it is purchased or received from the supplier

au jus - roasted meats, poultry or game served with their natural, un-thickened juices.

au sec - cooked until nearly dry.

bacteria - single-celled microorganisms, some of which can cause diseases, including food-borne diseases.

bain marie - a hot-water bath used to gently cook food or keep cooked food hot; (2) a container for holding food in a hot-water bath.

baking - a dry-heat cooking method in which foods are surrounded by hot, dry air in a closed environment; similar to roasting, the term baking is usually applied to breads, pastries, vegetables and fish.

ballotine - similar to a galantine; usually made by stuffing a deboned poultry leg with forcemeat; it is then poached or braised and normally served hot.

barbecue - to cook foods over dry heat created by the burning of hardwood or hardwood charcoals; (2) a tangy tomato- or vinegar-based sauce used for grilled foods ; (3) foods cooked by this method and/or with this sauce.

barding - tying thin slices of fat, such as bacon or pork fatback, over meats or poultry that have little to no natural fat covering in order to protect and moisten them during roasting.

base - a substance that neutralizes an acid in a liquid solution; ingredients such as sodium bicarbonate (baking soda) that have an alkaline or bitter flavor; bases have a pH of more than 7.

baste - to moisten foods during cooking (usually grilling, broiling or roasting) with melted fat, pan drippings, a sauce or other liquids to prevent drying and to add flavor.

batonnet - foods cut into matchstick shapes of 1/4 inch X 1/4 inch X 2 inches (6 millimeters X 6 millimeters X 5 centimeters).

beating - a mixing method in which foods are vigorously agitated to incorporate air or develop gluten; a spoon or electric mixer with its paddle attachment is used.

biological hazard - a danger to the safety of food caused by disease-causing microorganisms such as bacteria, molds, yeasts, viruses or fungi.

biscuit method - a mixing method used to make biscuits, scones and flaky doughs; it involves cutting cold fat into the flour and other dry ingredients before any liquid is added.

bisque - a soup made from shellfish; classic versions are thickened with rice.

blanching - very briefly and partially cooking a food in boiling water or hot fat; used to assist

preparation (for example, to loosen peels from vegetables), as part of a combination cooking method or to remove undesirable flavors.

blending - a mixing method in which two or more ingredients are combined just until they are evenly distributed.

bloom - (1) a white, powdery layer that sometimes appears on chocolate if the cocoa butter separates; (2) a measure of gelatin's strength; (3) to soften granulated gelatin in a cold liquid before dissolving and using.

blue cheese - (1) a generic term for any cheese containing visible blue-green molds that contribute a characteristic tart, sharp flavor and aroma; also known as a blue-veined cheese or bleu; (2) a group of Roquefort-style cheeses made in the United States and Canada from cow's or goat's milk rather than ewe's milk and injected with molds that form blue-green veins; also known as blue mold cheese or blue-veined cheese.

boiling - a moist-heat cooking method that uses convection to transfer heat from a hot (approximately 212°F/ 100°C) liquid to the food submerged in it; the turbulent waters and higher temperatures cook foods more quickly than do poaching or simmering.

bouchees - small puff pastry shells that can be filled and served as bite-size hors d'oeuvre or petit fours.

bound salad - a salad composed of cooked meats, poultry, fish, shellfish, pasta or potatoes combined with a dressing.

bouquet garni - fresh herbs and vegetables tied into a bundle with twine and used to flavor stocks, sauces, soups and stews.

boxed beef - industry terminology for primal and sub-primal cuts of beef that are vacuum sealed and packed into cardboard boxes for shipping from the packing plant to retailers and food service operations.

braising - a combination cooking method in which foods are first browned in hot fat, then covered and slowly cooked in a small amount of liquid over low heat; braising uses a combination of simmering and steaming to transfer heat from the liquid (conduction) and the air (convection) to the foods.

brandy - an alcoholic beverage made by distilling wine or the fermented mash of grapes or other fruits.

brawn - also called an aspic terrine, made from simmered meats packed into a terrine and covered with aspic.

brazier; brasier - a pan designed for braising; usually round with two handles and a tight-fitting lid

brigade - a system of staffing a kitchen so that each worker is assigned a set of specific tasks; these tasks are often related by cooking method, equipment or the types of foods being produced.

brine - a mixture of salt, water and seasonings used to preserve foods.

brochettes - skewers, either small hors d'oeuvre or large entree size, threaded with meat, poultry, fish, shellfish and/or vegetables and grilled, broiled or baked; sometimes served with a dipping sauce.

broiling - a dry-heat cooking method in which foods are cooked by heat radiating from an overhead source

broth - a flavorful liquid obtained from the long simmering of meats and/or vegetables.

brown stock - a richly colored stock made of chicken, veal, beef or game bones and vegetables, all of which are caramelized before they are simmered in water with seasonings.

brunch - a late-morning to early-afternoon meal that takes the place of both breakfast and lunch; a brunch menu often offers breakfast foods as well as almost anything else.

brunoise - (1) foods cut into cubes of 1/8 inch X 1/8 inch X 1/8 inch (3 millimeters X 3 millimeters X 3 millimeters); a 1/16-inch (1.5-millimeter) cube is referred to as a fine brunoise; (2) foods garnished with vegetables cut in this manner

buffet service - restaurant service in which diners generally serve themselves foods arranged on a counter or table or are served by workers assigned to specific areas of the buffet. Usually 'buffet service style' restaurants charge by the meal; restaurants offering buffet service that charge by the dish are known as cafeterias.

bun - any of a variety of small, round yeast rolls; can be sweet or savory.

butcher - to slaughter and/or dress or fabricate animals for consumption.

butler service - restaurant service in which servers pass foods (typically hors d'oeuvre) or drinks arranged on trays.

butterfly - to slice boneless meat, poultry or fish nearly in half lengthwise so that it spreads open like a book.

calf - (1) a young cow or bull; (2) the meat of calves slaughtered when they are older than five months.

calorie - the unit of energy measured by the amount of heat required to raise 1000 grams of water one degree Celsius; it is also written as kilocalorie or kcal.

canapé - tiny open-faced sandwich served as an hors d'oeuvre; usually composed of a small piece of bread or toast topped with a savory spread and garnish.

capon - the class of surgically castrated male chickens; they have well-flavored meat and soft, smooth skin

capsaicin - an alkaloid found in a chili pepper 's placental ribs that provides the pepper's heat.

caramelization - the process of cooking sugars; the browning of sugar enhances the flavor and appearance of foods.

Carbohydrates - a group of compounds composed of oxygen, hydrogen and carbon that supply the body with energy (4 calories per gram); carbohydrates are classified as simple (including certain sugars) and complex (including starches and fiber)

carotenoid - a naturally occurring pigment that predominates in red and yellow vegetables such as carrots and red peppers.

carryover cooking - the cooking that occurs after a food is removed from a heat source; it is accomplished by the residual heat remaining in the food.

cartilage - also known as gristle; a tough, elastic, whitish connective tissue that helps give structure to an animal's body.

carve - to cut cooked meat or poultry into portions casings- membranes used to hold forcemeat for sausages; they can be natural animal intestines or manufactured from collagen extracted from cattle hides.

caul fat - a fatty membrane from pig or sheep intestines; it resembles fine netting and is used to bard roasts and pates and to encase forcemeat for sausages.

cellulose- a complex carbohydrate found in the cell wall of plants ; it is edible but indigestible by humans

cephalopods--mollusks with a single, thin internal shell called a pen or cuttlebone, well-developed eyes, a number of arms that attach to the head and a saclike fin-bearing mantle ; include squid and octopus

Certified Angus Beef- a brand created in 1978 to distinguish the highest-quality beef produced from descendants of the black, hornless Angus cattle of Scotland. The meat must meet American Angus Association standards for yield, marbling and age, and be graded as high choice or prime.

chafing dish- a metal dish with a heating unit (flame or electric) used to keep foods warm at tableside or during buffet service.

charcuterie - the production of pates , terrines, galantines , sausages and similar foods.

cheesecloth - a light, fine mesh gauze used to strain liquids and make sachets.

chef de cuisine - also known simply as chef ; the person responsible for all kitchen operations , developing menu items and setting the kitchen's tone and tempo.

chef de partie - also known as station chef; produces the menu items under the direct supervision of the chef or sous-chef.

chefs knife - an all-purpose knife used for chopping, slicing and mincing ; its tapering blade is 8-14 inches (20- 35 centimeters) long.

chemical hazard - a danger to the safety of food caused by chemical substances, especially cleaning agents, pesticides and toxic metals.

chevre - French for "goat"; generally refers to a cheese made from goat's milk.

chiffonade - to finely slice or shred leafy vegetables or herbs.

china cap - a cone-shaped strainer made of perforated metal.

chine - the backbone or spine of an animal; a sub-primal cut of beef, veal, lamb, pork or game carcass containing a portion of the backbone with some adjoining flesh.

chinois - a conical strainer made of fine mesh, used for straining and pureeing foods.

cholesterol - a fatty substance found in foods derived from animal products and in the human body; it has been linked to heart disease.

chop - (1) a cut of meat, including part of the rib; (2) to cut into pieces when uniformity of size and shape is not important.

chorizo - a coarse, spicy pork sausage flavored with ground chilies and removed from its casing before cooking; used in Mexican and Spanish cuisines.

chutney - a sweet-and-sour condiment made of fruits and/ or vegetables cooked in vinegar with sugar and spices; some chutneys are reduced to a puree, while others retain recognizable pieces of their ingredients.

cider - mildly fermented apple juice; non-alcoholic apple juice may also be labeled cider.

citrus - fruits characterized by a thick rind, most of which is a bitter white pith with a thin exterior layer of colored skin (zest); their flesh is segmented and juicy and varies from bitter to tart to sweet.

clarification - (1) the process of transforming a broth into a clear consommé by trapping impurities with a clearmeat consisting of the egg white protein albumen, ground meat, an acidic product, mirepoix and other ingredients; (2) the clearmeat used to clarify a broth.

clarified butter - purified butterfat; the butter is melted and the water and milk solids are removed.

classic cuisine - a late 19th- and early 20th-century refinement and simplification of French Grande

Cuisine. Classic (or classical) cuisine relies on the thorough exploration of culinary principles and techniques, and emphasizes the refined preparation and presentation of superb ingredients.

clean - to remove visible dirt and soil.

clear soups – un-thickened soups, including broths, consommés and broth-based soups.

clearmeat - see clarification.

club roll - a small oval-shaped roll made of crusty French bread.

coagulation - the irreversible transformation of proteins from a liquid or semi-liquid state to a drier, solid state; usually accomplished through the application of heat.

cojita - an aged, hard, salty Mexican cow's-milk cheese; similar to feta, although not soaked in brine.

colander - a perforated bowl, with or without a base or legs, used to strain foods.

collagen - a protein found in connective tissue; it is converted into gelatin when cooked with moisture.

combination cooking methods - cooking methods, principally braising and stewing, that employ both dry-heat and moist-heat procedures.

composed salad - a salad prepared by arranging each of the ingredients (the base, body, garnish and dressing) on individual plates in an artistic fashion.

composition - a completed plate's structure of colors, shapes and arrangements.

compound butter - also known as a *beurre composé*, a mixture of softened whole butter and flavorings used as a sauce or to flavor and color other sauces.

compound sauces - *see* Small sauces.

concasse - peeled, seeded and diced tomato.

concasser - to pound or chop coarsely; usually used for tomatoes or parsley.

concentrate - also known as a fruit paste or compound; a reduced fruit puree, without a gel structure, used as a flavoring.

condiment - traditionally, any item added to a dish for flavor, including herbs, spices and vinegars; now also refers to cooked or prepared flavorings such as prepared mustards, relishes, bottled sauces and pickles.

conduction - the transfer of heat from one item to another through direct contact.

confit - meat or poultry (often lightly salt-cured) slowly cooked and preserved in its own fat and served hot.

connective tissue - tissue found throughout an animal's body that binds together and supports other tissues such as muscles.

consommé - a rich stock or broth that has been clarified with clearmeat to remove impurities.

contaminants - biological, chemical or physical substances that can be harmful when consumed in sufficient quantities.

contamination - the presence, generally unintentional, of harmful organisms or substances.

convection - the transfer of heat caused by the natural movement of molecules in a fluid (whether air, water or fat) from a warmer area to a cooler one; mechanical convection is the movement of molecules caused by stirring.

conversion factor (C.F.) - the number used to increase or decrease ingredient quantities and recipe yields

cookery - the art, practice or work of cooking.

cookie press - also known as a cookie gun , a hollow tube fitted with a plunger and an interchangeable decorative tip or plate; soft cookie dough is pressed through the tip to create shapes or patterns.

cookies - small, sweet, flat pastries; usually classified by preparation or makeup techniques as drop, icebox, bar, cutout, pressed and wafer.

cooking - (1) the transfer of energy from a heat source to a food; this energy alters the food's molecular structure, changing its texture, flavor, aroma and appearance; (2) the preparation of food for consumption

cooking medium - the air, fat, water or steam in which a food is cooked.

coring - the process of removing the seeds or pit from a fruit or fruit- vegetable.

cost of goods sold – the total cost of food items sold during a given period; calculated as beginning inventory plus purchases minus ending inventory. When divided by sales equals food cost percentage.

cost per portion - the amount of the total recipe cost divided by the number of portions produced from that recipe; the cost of one serving.

coulibiac - a creamy mixture of salmon fillet, rice, hard-cooked eggs, mushrooms , shallots and dill enclosed in a pastry envelope usually made of brioche dough.

coulis - a sauce made from a puree of vegetables and/ or fruit; may be served hot or cold.

count - the number of individual items in a given measure of weight or volume.

court bouillon - water simmered with vegetables , seasonings and an acidic product such as vinegar or wine; used for simmering or poaching fish, shellfish or vegetables.

cows - female cattle after their first calving, principally raised for milk and calf production.

cracking- a milling process in which grains are broken open.

creams - also known as crèmes; include light, fluffy or creamy- textured dessert foods made with whipped cream or whipped egg whites, such as Bavarian creams, chiffons, mousses and crème Chantilly

cream sauce - a sauce made by adding cream to a béchamel sauce

cream soup - a soup made from vegetables cooked in a liquid that is thickened with a starch and pureed; cream is then incorporated to acid richness and flavor

crepe - a thin, delicate unleavened griddlecake made with a very thin egg batter cooked in a very hot sauté pan; used in sweet and savory preparations

critical control point - a step during the processing of food when a mistake can result in the transmission, growth or survival of pathogenic bacteria

croissant - a crescent-shaped roll made from a rich, rolled -in yeast dough

croquembouche - a pyramid of small puffs, each filled with pastry cream; a French tradition for Christmas and weddings, it is held together with caramelized sugar and decorated with spun sugar or marzipan flowers

croquette - a food that has been pureed or bound with a thick sauce (usually béchamel or veloute) , made into small shapes and then breaded and deep-fried

cross-contamination - the transfer of bacteria or other contaminants from one food, work surface or piece of equipment to another

croffte, en - describes a food encased in a bread or pastry crust

crouton - a bread or pastry garnish, usually toasted or sautéed until crisp

crudités - generally refers to raw or blanched vegetables served as an hors d'oeuvre and often accompanied by a dip

crumb - the interior of bread or cake; may be elastic, aerated, fine grained or coarse grained

crustaceans - shellfish characterized by a hard outer skeleton or shell and jointed appendages; include lobsters, crabs and shrimp

cuisine - the ingredients, seasonings , cooking procedures and styles attributable to a particular group of people; the group can be defined by geography, history, ethnicity, politics, culture or religion

cuisson - the liquid used for shallow poaching

curing salt - a mixture of salt and sodium nitrite that inhibits bacterial growth; used as a preservative, often for charcuterie items

cutlet - a relatively thick, boneless slice of meat

cutting – (1) reducing a food to smaller pieces; (2) a mixing method in which solid fat is incorporated into dry ingredients until only lumps of the desired size remain

cutting loss - the unavoidable and unrecoverable loss of food during fabrication; the loss is usually the result of food particles sticking to the cutting board or the evaporation of liquids

cuttlebone - also known as the pen, the single, thin internal shell of cephalopods

cycle menu - a menu that changes every day for a certain period and then repeats the same daily items in the same order (for example, on a seven-day cycle, the same menu is used every Monday)

dairy products - include cow's milk and foods produced from cow's milk such as butter, yogurt , sour cream

and cheese; sometimes other milks and products made from them are included (e.g., goat's milk cheese)

decant - to separate liquid from solids without disturbing the sediment by pouring off the liquid; vintage wines are often decanted to remove sediment

decline phase - a period during which bacteria die at an accelerated rate, also known as the negative growth phase

decoction - (1) boiling a food until its flavor is removed; (2) a procedure used for brewing coffee

deep –frying - a dry-heat cooking method that uses convection to transfer heat to a food submerged in hot fat; foods to be deep-fried are usually first coated in batter or breading

deglaze - to swirl or stir a liquid (usually wine or stock) in a pan to dissolve cooked food particles remaining on the bottom; the resulting mixture often becomes the base for a sauce

degrease - to remove fat from the surface of a liquid such as a stock or sauce by skimming, scraping or lifting congealed fat

demi-glace - French for "half-glace"; a mixture of half brown stock and half brown sauce reduced by half

density - the relationship between the mass and volume of a substance ($D = m/v$). For example, as more and more sugar is dissolved in a liquid, the heavier or denser the liquid will become. Sugar density is measured on the Baume scale using a hydrometer or saccharometer.

deveining - the process of removing a shrimp's digestive tract

deviled - describes meat, poultry or other food seasoned with mustard, vinegar and other spicy seasonings

diagonals - oval-shaped slices

dice - to cut into cubes with six equal-sized sides

dip - a thick, creamy sauce, served hot or cold, to accompany crudités, crackers, chips or other foods, especially as an hors d'oeuvre; dips are often based on sour cream, mayonnaise or cream cheese

direct contamination - the contamination of raw foods in their natural setting or habitat

distillation - the separation of alcohol from a liquid (or, during the production of alcoholic beverages, from a fermented mash); it is accomplished by heating the liquid or mash to a gas that contains alcohol vapors; this steam is then condensed into the desired alcoholic liquid (beverage)

distilled water - water that has had all the minerals and impurities removed through distillation; it is generally used for pharmaceutical purposes

diver scallops - scallops that are harvested from the ocean by divers who hand-pick each one; diver scallops tend to be less gritty than those harvested by dragging, and hand-harvesting is more ecologically friendly

docking - pricking small holes in an unbaked dough or crust to allow steam to escape and to prevent the dough from rising when baked

dough - a mixture of flour and other ingredients used in baking; has a low moisture content, and gluten forms the continuous medium into which other ingredients are embedded; it is often stiff enough to cut into shapes

drawn - a market form for fish in which the viscera is removed

dress - to trim or otherwise prepare an animal carcass for consumption

dressed - a market form for fish in which the viscera, gills, fins and scales are removed

dry-heat cooking methods - cooking methods, principally broiling, grilling, roasting and baking, sautéing, pan-frying and deep-frying, that use air or fat to transfer heat through conduction and convection; dry-heat cooking methods allow surface sugars to caramelize

drying - a preservation method in which the food's moisture content is dramatically reduced; drying changes the food's texture, flavor and appearance

duckling - duck slaughtered before it is eight weeks old

edible portion (E.P.) - the amount of a food item available for consumption or use after trimming or fabrication; a smaller, more convenient portion of a larger or bulk unit

elastin - a protein found in connective tissues, particularly ligaments and tendons; it often appears as the white or silver covering on meats known as silver skin

emince - small, thin, boneless piece of meat

emulsification - the process by which generally unmixable liquids, such as oil and water, are forced into a uniform distribution

emulsion - a uniform mixture of two unmixable liquids; it is often temporary (for example, oil in water)

entrée - the main dish of an American meal, usually meat, poultry, fish or shellfish accompanied by a vegetable and starch; in France, the first course, served before the fish and meat courses

Enzymes - proteins that aid specific chemical reactions in plants and animals

escargot - French for "snail"; those used for culinary purposes are land snails (genus *Helix*); the most popular are the large Burgundy snails and the smaller but more flavorful common or garden snail known as petit gris

essence - a sauce made from a concentrated vegetable juice

essential nutrients - nutrients that must be provided by food because the body cannot or does not produce them in sufficient quantities

essential oils - pure oils extracted from the skins, peels and other parts of plants used to give their aroma and taste to flavoring agents in foods, cosmetics and other products

ethnic cuisine - the cuisine of a group of people having a common cultural heritage, as opposed to the cuisine of a group of people bound together by geography or political factors

ethylene gas - a colorless, odorless hydrocarbon gas naturally emitted from fruits and fruit-vegetables that encourages ripening

evaporation - the process by which heated water molecules move faster and faster until the water turns to a gas (steam) and vaporizes; evaporation is responsible for the drying of foods during cooking

extracts--concentrated mixtures of ethyl alcohol and flavoring oils such as vanilla, almond and lemon

extrusion - the process of forcing pasta dough through perforated plates to create various shapes; pasta dough that is not extruded must be rolled and cut

fabricate - to cut a larger portion of raw meat (for example, a primal or sub primal), poultry or fish into smaller portions

fabricated cuts - individual portions cut from a sub-primal

facultative bacteria - those that can adapt and will survive with or without oxygen

fancy - (1) fish that has been previously frozen; (2) a quality grade for fruits, especially canned or frozen

fatback - fresh pork fat from the back of the pig, used primarily for barding

fats - (1) a group of compounds composed of oxygen, hydrogen and carbon atoms that supply the body with energy (9 calories per gram); fats are classified as saturated, monounsaturated or polyunsaturated; (2) the general term for butter, lard, shortening, oil and margarine used as cooking media or ingredients

fermentation - the process by which yeast converts sugar into alcohol and carbon dioxide; it also refers to the time
feuilletés - square, rectangular or diamond-shaped puff pastry boxes; may be filled with a sweet or savory mixture

FIFO (first in, first out) - a system of rotating inventory, particularly perishable and semi-perishable goods, in which items are used in the order in which they are received

file' - a seasoning and thickening agent made from dried, ground sassafras leaves

filet, fillet - (1) filet: a boneless tenderloin of meat; (2) fillet: the side of a fish removed intact, boneless or semiboneless, with or without skin; (3) to cut such a piece

fish veloute - a veloute sauce made from fish stock

flash-frozen - describes food that has been frozen very rapidly using metal plates, extremely low temperatures or chemical solutions

flash point - the temperature at which a fat ignites and small flames appear on the surface of the fat

flatfish - fish with asymmetrical, compressed bodies that swim in a horizontal position and have both eyes on the top of the head; include sole, flounder and halibut

flavor- an identifiable or distinctive quality of a food, drink or other substance perceived with the combined senses of taste, touch and smell

flavoring - an item that adds a new taste to a food and alters its natural flavors; flavorings include herbs, spices, vinegars and condiments; the terms *seasoning* and *flavoring* are often used interchangeably.

fleur-de-lis - a crescent-shaped piece of puff pastry used as a garnish

flour - a powdery substance of varying degrees of fineness made by milling grains such as wheat, corn or rye

fluoridated water - water, either naturally fluoridated or treated with a fluorine-containing compound, intended to promote healthy teeth by preventing tooth decay

foamed milk - milk that is heated and frothed with air and steam generated by an espresso machine; it will be slightly cooler than steamed milk

foie gras - liver of specially fattened geese

fond - (1) French for "stock" or "base"; (2) the concentrated juices, drippings and bits of food left in pans after foods are roasted or sautéed; it is used to flavor sauces made directly in the pans in which foods were cooked

fond lie - *see jus lie*

fondue - a Swiss specialty made with melted cheese, wine and flavorings; eaten by dipping pieces of bread into the hot mixture with long forks

food cost - the cost of the materials that go directly into the production of menu items

food cost percentage - the ratio of the cost of foods used to the total food sales during a set period, calculated by dividing the cost of food used by the total sales in a restaurant

Force meat - a preparation made from uncooked ground meats, poultry, fish or shellfish, seasoned, and emulsified with fat; commonly prepared as country-style, basic and mousseline and used for charcuterie items

formula - the standard term used throughout the industry for a bakeshop recipe; formulas rely on weighing to ensure accurate measuring of ingredients

free-range chickens - chickens allowed to move freely and forage for food; as opposed to chickens raised in coops

free-range veal - the meat of calves that are allowed to roam freely and eat grasses and other natural foods; this meat is pinker and more strongly flavored than that of milk-fed calves

freezer burn - the surface dehydration and discoloration of food that results from moisture loss at below-freezing temperatures

Frenching - a method of trimming racks or individual chops of meat, especially lamb, in which the excess fat is cut away, leaving the eye muscle intact; all meat and connective tissue are removed from the rib bone

fresh-frozen - describes a food that has been frozen while still fresh

fricassee - a white stew in which the meat is cooked in fat without browning before the liquid is added

frying - a dry-heat cooking method in which foods are cooked in hot fat; includes sautéing and stir-frying, pan-frying and deep-frying

fumet - a stock made from fish bones or shellfish shells and vegetables simmered in a liquid with flavorings

fungi - a large group of plants ranging from single-celled organisms to giant mushrooms; the most common are molds and yeasts

fusion cuisine - the blending or use of ingredients and/or preparation methods from various ethnic, regional or national cuisines in the same dish; also known as transnational cuisine

galantine - similar to a ballotine; a charcuterie item made from a forcemeat of poultry, game or suckling pig usually wrapped in the skin of the bird or animal and poached in an appropriate stock; often served cold, usually in aspic game-birds and animals hunted for sport or food; many game birds and animals are now ranch-raised and commercially available

game hen - the class of young or immature progeny of Cornish chickens or of a Cornish chicken and White Rock chicken; they are small and very flavorful

garde-manger - (1) also known as the pantry chef, the cook in charge of cold food production, including salads and salad dressings, charcuterie items, cold appetizers and buffet items; (2) the work area where these foods are prepared

garnish - (1) food used as an attractive decoration; (2) a subsidiary food used to add flavor or character to the main ingredient in a dish (for example, noodles in chicken noodle soup)

gastrique - caramelized sugar deglazed with vinegar; used to flavor tomato or savory fruit sauces

gastronomy - the art and science of eating well

gaufrette - a thin lattice or waffle-textured slice of vegetable cut on a mandolin

gaufrette potatoes - thin, fried, lattice-cut slices of potato

gelatin - a tasteless and odorless mixture of proteins (especially collagen) extracted from boiling bones, connective tissue and other animal parts; when dissolved in a hot liquid and then cooled, it forms a jellylike substance used as a thickener and stabilizer

gelatinization - the process by which starch granules are cooked; they absorb moisture when placed in a liquid and heated; as the moisture is absorbed, the product swells, softens and clarifies slightly.

ghee - a form of clarified butter in which the milk solids remain with the fat and are allowed to brown; originating in India and now used worldwide as an ingredient and cooking medium, it has a long shelf life, a high smoke point and a nutty, caramel-like flavor

giblets - the collective term for edible poultry viscera, including gizzards, hearts, livers and necks.

Gizzard - a bird's second stomach

glacage - browning or glazing a food, usually under a salamander or broiler

glace de poisson - a syrupy glaze made by reducing a fish stock

glace de viande - a dark, syrupy meat glaze made by reducing a brown stock

glace de volaille - a light brown, syrupy glaze made by reducing a chicken stock

glaze – (1) any shiny coating applied to food or created by browning; (2) the dramatic reduction and concentration of a stock; (3) a thin, flavored coating poured or dripped onto a cake or pastry

global cuisine - foods (often commercially produced items) or preparation methods that have become ubiquitous throughout the world; for example, curries and French-fried potatoes

gougere eclair- pastry favored with cheese baked and served as a savory hors d'oeuvre

gourmand -- a connoisseur of fine food and drink, often to excess

gourmet - a connoisseur of fine food and drink

gourmet foods - foods of the highest quality, perfectly prepared and beautifully presented

grading - a series of voluntary programs offered by the U.S. Department of Agriculture to designate a food's overall quality

grains – (1) grasses that bear edible seeds, including corn, rice and wheat; (2) the fruit (that is, the seed or kernel) of such grasses

gram - the basic unit of weight in the metric system; equal to approximately 1/16 of an ounce

grande cuisine - the rich, intricate and elaborate cuisine of the 18th- and 19th-century French aristocracy and upper classes. It is based on the rational identification, development and adoption of strict culinary principles. By emphasizing the how and why of cooking, *grande cuisine* was the first to distinguish itself from regional cuisines, which tend to emphasize the tradition of cooking.

grate - to cut a food into small, thin shreds by rubbing it against a serrated metal plate known as a grater

gravy - a sauce made from meat or liquid and thickening agent; usually made in the pan in which the meat or poultry was cooked

green meats - freshly slaughtered meats that have not had sufficient time to age and develop tenderness and flavor

gremolata - an aromatic garnish of chopped parsley, garlic and lemon zest used for osso buco

grilling - a dry-heat cooking method in which foods are cooked by heat radiating from a source located below the cooking surface; the heat can be generated by electricity or by burning gas, hardwood or hardwood charcoals

grind - to pulverize or reduce food to small particles using a mechanical grinder or food processor

grinding - a milling process in which grains are reduced to a powder; the powder can be of differing degrees of fineness or coarseness

gristle - see cartilage

grosse piece - a centerpiece consisting of a large piece of the principal food offered; for example, a large wheel of cheese with slices of the cheese cascading around it

HACCP - see Hazard Analysis Critical Control Points

hanging - the practice of allowing eviscerated (drawn or gutted) game to age in a city , well-ventilated place; hanging helps tenderize the flesh and strengthen its flavor

hard water - water with relatively high calcium and magnesium concentrations

Hazard Analysis Critical Control Points (HACCP) - a rigorous system of self-inspection used to manage and maintain sanitary conditions in all types of food service operations; it focuses on the flow of food through the food service facility to identify any point or step in preparation (known as a critical control point) where some action must be taken to prevent or minimize a risk or hazard

Heimlich maneuver - the first-aid procedure for choking victims in which sudden upward pressure is applied to the upper abdomen in order to force any foreign object from the windpipe

herb - any of a large group of aromatic plants whose leaves, stems or flowers are used as a flavoring; used either dried or fresh

hollandaise - an emulsified sauce made of butter, egg yolks and flavorings (especially lemon juice)

homogenization - the process by which milk fat is prevented from separating out of milk products

hors d'oeuvre - very small portions of hot or cold foods served before the meal to stimulate the appetite

hotel pan- a rectangular, stainless steel pan with a lip allowing it to rest in a storage shelf or steam table; available in several standard sizes

hull - also known as the husk, the outer covering of a fruit, seed or grain

hulling - a milling process in which the hull or husk is removed from grains

hybrid - the result of cross-breeding different species that are genetically unlike; often a unique product

hybrid menu - a menu combining features of a static menu with a cycle menu or a market menu of specials

hydrogenation - the process used to harden oils; hydrogen atoms are added to unsaturated fat molecules, making them partially or completely saturated and thus solid at room temperature

hydrometer- a device used to measure specific gravity; it shows degrees of concentration on the Baume scale

hygroscopic - describes a food that readily absorbs moisture from the air

IMPS/NAMP - see NAMP/TMPS

incidental food additives- those inadvertently or unintentionally added to foods during processing, such as pesticide residues on fruits

induction cooking - a cooking method that uses a special coil placed below the stove top's surface in combination with specially designed cookware to generate heat rapidly with an alternating magnetic field

infection - in the food safety context, a disease caused by the ingestion of live pathogenic bacteria that continue their life processes in the consumer's intestinal tract

infrared cooking - a heating method that uses an electric or ceramic element heated to such a high temperature that it gives off waves of radiant heat that cook the food

infuse - to flavor a liquid by steeping it with ingredients such as tea, coffee, herbs or spices

infusion - (1) the extraction of flavors from a food at a temperature below boiling; (2) a group of coffee brewing techniques, including steeping, filtering and dripping; (3) the liquid resulting from this process

instant-read thermometer - a thermometer used to measure the internal temperature of foods; the stem is inserted in the food, producing an instant temperature readout

intentional food additives - those added to foods on purpose, such as the chemicals used to ensure longer shelf life or food colorings

intoxication - in the food safety context, a disease caused by the toxins that bacteria produce during their life processes

inventory - the listing and counting of all foods in the kitchen, storerooms and refrigerators

IQF (individually quick-frozen) - describes the technique of rapidly freezing each individual item of

food such as slices of fruit, berries or pieces of fish before packaging; IQF foods are not packaged with syrup or sauce

irradiation - a preservation method used for certain fruits, vegetables, grains, spices, meat and poultry in which ionizing radiation sterilizes the food, slows ripening and prevents sprouting

jam - a fruit gel made from fruit pulp and sugar

jelly - a fruit gel made from fruit juice and sugar

juice - the liquid extracted from any fruit or vegetable

julienne - (1) to cut foods into stick-shaped pieces, approximately 1/8 inch X 1/8 inch X 2 inches (3 millimeters X 3 millimeters X 5 centimeters); a fine julienne has dimensions of 1/16 inch X 1/16 inch X 2 inches (1.5 millimeters X 1.5 millimeters X 5 centimeters); (2) the stick-shaped pieces of cut food

jus lie - also known as fond lie; a sauce made by thickening brown stock with cornstarch or similar starch; often used like a demi-glace, especially to produce small sauces

Kobe beef - an exclusive type of beef traditionally produced in Kobe, Japan. Wagyu cattle are fed a special diet, which includes beer to stimulate the animal's appetite during summer months. The animals are massaged with sake to relieve stress and muscle stiffness in the belief that calm, contented cattle produce better-quality meat. This special treatment produces meat that is extraordinarily tender and full-flavored, and extraordinarily expensive. Kobe Beef America introduced Wagyu cattle to the United States in 1976. KBA's cattle are raised without hormones and the meat is dry-aged for 21 days prior to sale.

Kosher - prepared in accordance with Jewish dietary laws

lag phase - a period , usually following transfer from one place to another, during which bacteria do not experience much growth

lamb - the meat of sheep slaughtered under the age of one year

lard - the rendered fat of hogs

larding - inserting thin slices of fat, such as pork fatback , into low-fat meats in order to add moisture

lardons - sliced, blanched, fried bacon

leading sauces - also known as mother sauces, the foundation for the entire classic repertoire of hot sauces; the five leading sauces (béchamel, veloute, espagnole [also known as brown], tomato and hollandaise) are distinguished by the liquids and thickeners used to make them; they can be seasoned and garnished to create a wide variety of small or compound sauces

lecithin- a natural emulsifier found in egg yolks

legumes - (1) French for "vegetables"; (2) a large group of vegetables with double-seamed

seed pods; depending upon the variety, the seeds, pod and seeds together, or the dried seeds are eaten

liaison - a mixture of egg yolks and heavy cream used to thicken and enrich sauces

liqueur - a strong, sweet, syrupy alcoholic beverage made by mixing or redistilling neutral spirits with

fruits, flowers, herbs, spices or other flavorings; also known as a cordial

liquor - an alcoholic beverage made by distilling grains, fruits, vegetables or other foods; includes rum , whiskey and vodka

liter - the basic unit of volume in the metric system, equal to slightly more than a quart

log phase - a period of accelerated growth for bacteria

macerate - to soak foods in a liquid, usually alcoholic, to soften them

macronutrients - the nutrients needed in large quantities: carbohydrates, proteins, fats and water

madeira - a Portuguese fortified wine heated during aging to give it a distinctive flavor and brown color

Magret - a duck breast, traditionally taken from the ducks that produce foie gras; it is usually served boneless but with the skin intact

maître d'hôtel - (1) the leader of the dining room brigade, also known as the dining room manager; oversees the dining room or "front of the house" staff; (2) a compound butter flavored with chopped parsley and lemon juice

mandolin - a stainless steel, hand- operated slicing device with adjustable blades

marbling - whitish streaks of inter- and intramuscular fat

marinade - the liquid used to marinate foods; it generally contains herbs, spices and other flavoring ingredients as well as an acidic product such as wine, vinegar or lemon juice

marinate - to soak a food in a seasoned liquid in order to tenderize the food and add flavor to it

market menu - a menu based upon product availability during a specific period ; it is written to use foods when they are in peak season or readily available

marmalade - a citrus jelly that also contains unpeeled slices of citrus fruit

marquise - a frozen mousse-like dessert, usually chocolate

marsala - a flavorful fortified sweet-to-semi dry Sicilian wine

marzipan - a paste of ground almonds, sugar and egg whites used to fill and decorate pastries

matignon - a standard mirepoix plus diced smoked bacon or smoked ham and, depending on the dish, mushrooms and herbs

mayonnaise - a thick , creamy sauce consisting of oil and vinegar emulsified with egg yolks, usually used as a salad dressing

meal - (1) the coarsely ground seeds of any edible grain such as corn or oats; (2) any dried, ground substance (such as bone meal)

mealy potatoes - also known as starchy potatoes; those with a high starch content and thick skin; they are best for baking

medallion - a small, round, relatively thick slice of meat

melting - the process by which certain foods, especially those high in fat, gradually soften and then liquefy when heated

menu - a list of foods and beverages available for purchase

meringue - a foam made of beaten egg whites and sugar

metabolism - all the chemical reactions and physical processes that occur continuously in living cells and organisms

meter - the basic unit of length in the metric system, equal to slightly more than 1 yard

micronutrients - the nutrients needed only in small amounts; vitamins and minerals

microorganisms - single-celled organisms as well as tiny plants and animals that can be seen only through a microscope

microwave cooking - a heating method that uses radiation generated by a special oven to penetrate the food; it agitates water molecules , creating friction and heat; this energy then spreads throughout the food by conduction (and by convection in liquids)

mignonette - (1) a medallion; (2) a vinegar sauce with shallots

milk-fed veal - also known as formula-fed veal; the meat of calves fed only a nutrient-rich liquid and kept tethered in pens; this meat is white and more mildly flavored than that of free-range calves

mince- to cut into very small pieces when uniformity of shape is not important

minerals - inorganic micronutrients necessary for regulating body functions and proper bone and tooth structures

mineral water - drinking water that comes from a protected underground water source and contains at least 250 parts per million of total dissolved solids such as calcium

mirepoix - a mixture of coarsely chopped onions, carrots and celery used to flavor stocks, stews and other foods; generally, a mixture of 50 percent onions, 25 percent carrots and 25 percent celery, by weight, is used

mise en place - French for "putting in place"; refers to the preparation and assembly of all necessary ingredients and equipment

miso - a thick paste made by salting and fermenting soybeans and rice or barley; generally used as a flavoring

mix - to combine ingredients in such a way that they are evenly dispersed throughout the mixture

moist-heat cooking methods - cooking methods, principally simmering, poaching, boiling and steaming, that use water or steam to transfer heat through convection; moist-heat cooking methods are used to emphasize the natural flavors of foods

mojo criollo - a citrus and herb marinade used in Latino cuisines; bottled brands are available in Hispanic markets

molding - the process of shaping foods, particularly grains and vegetables bound by sauces, into attractive, hard-edged shapes by using metal rings, circular cutters or other forms

molds - (1) algae-like fungi that form long filaments or strands; for the most part, molds affect only food appearance and flavor; (2) containers used for shaping foods

mollusks - shellfish characterized by a soft, unsegmented body, no internal skeleton and a hard outer shell

monounsaturated fats - see unsaturated fats

monter au beurre - to finish a sauce by swirling or whisking in butter (raw or compound) until it is melted; used to give sauces shine, flavor and richness

mortadella - an Italian smoked sausage made with ground beef, pork and pork fat, flavored with coriander and white wine; it is air-dried and has a delicate flavor; also a large American bologna-type pork sausage stuffed with pork fat and garlic

mortar and pestle - a hard bowl (the mortar) in which foods such as spices are ground or pounded into a powder with a club-shaped tool (the pestle)

mother sauces - *see* leading sauces

mousse - a soft, creamy food, either sweet or savory, lightened by adding whipped cream, beaten egg whites or both

mousseline - a cream or sauce lightened by folding in ,whipped cream

mouthfeel - the sensation created in the mouth by a combination of a food 's taste, smell, texture and temperature

muesli - a breakfast cereal made from raw or toasted cereal grains, dried fruits, nuts and dried milk solids and usually eaten with milk or yogurt; sometimes known as granola

muffin method - a mixing method used to make quick-bread batters; it involves combining liquid fat with other liquid ingredients before adding them to the dry ingredients

muscles-- animal tissues consisting of bundles of cells or fibers that can contract and expand; they are the portions of a carcass usually consumed

mushrooms - members of a broad category of plants known as fungi; they are often used and served like vegetables

mutton - the meat of sheep slaughtered after they reach the age of one year

NAMP/IMPS - the Institutional Meat Purchasing Specifications (IMPS) published by the U.S. Department of

Agriculture; the IMPS are illustrated and described in The Meat Buyer's Guide published by the National Association of Meat Purveyors (NAMP)

nappe - (1) the consistency of a liquid, usually a sauce , that will coat the back of a spoon; (2) to coat a food with sauce. Truly nappe is French for “to brush”. A la Nappe is to coat the back of a spoon.

national cuisine - the characteristic cuisine of a nation

natural water - bottled drinking water not derived from a municipal water supply; it can be mineral, spring, well or artesian-well water

navarin - a brown ragout generally made with turnips , other root vegetables, onions , peas and lamb

nectar- the diluted, sweetened juice of peaches, apricots, guavas , black currants or other fruits, the juice of which would be too thick or too tart to drink straight

neutral spirits or grain spirits - pure alcohol (ethanol or ethyl alcohol); they are odorless , tasteless and a very potent 190 proof (95% alcohol)

New American cuisine - late- 20th-century movement that began in California but has spread across the United States; it stresses the use of fresh, locally grown, seasonal produce and high -quality ingredients simply prepared in a fashion that preserves and emphasizes natural flavors

noisette - a small, usually round, portion of meat cut from the rib

noodles - flat strips of pasta-type dough made with eggs; may be fresh or dried

nouvelle cuisine - French for "new cooking"; a mid-20th-century movement away from many classic cuisine principles and toward a lighter cuisine based on natural flavors, shortened cooking times and innovative combinations

nut – (1) the edible single-seed kernel of a fruit surrounded by a hard shell; (2) generally , any seed or fruit with an edible kernel in a hard shell

nutrients - the chemical substances found in food that nourish the body by promoting growth, facilitating body functions and providing energy; there are six categories of nutrients: proteins, carbohydrates, fats, water, minerals and vitamins

nutrition - the science that studies nutrients

oblique cuts - small pieces with two angle-cut sides

offal - also called variety meats; edible entrails (for example, the heart, kidneys, liver, sweetbreads and tongue) and extremities (for example, oxtail and pig's feet) of an animal

oignon brule- French for "burnt onion"; made by charring onion halves; used to flavor and color stocks and sauces

oignon pique - French for "pricked onion"; a bay leaf tacked with a clove to a peeled onion; used to flavor sauces and soups

oil - a type of fat that remains liquid at room temperature

organic farming - a method of farming that does not rely on synthetic pesticides, fungicides , herbicides or fertilizers

overhead costs - expenses related to operating a business, including but not limited to costs for advertising, equipment leasing , insurance , property rent, supplies and utilities

over run - the amount of air churned into an ice cream during freezing

paillard - a scallop of meat pounded until thin, usually grilled

palate - (1) the complex of smell, taste and touch receptors that contribute to a person's ability to recognize and appreciate flavors; (2) the range of an individual's recognition and appreciation of flavors

panada; panade - (1) something other than fat added to a forcemeat to enhance smoothness, aid emulsification or both; it is often béchamel, rice or crust less white bread soaked in milk; (2) a mixture for binding stuffing and dumplings, notably quenelles, often choux pastry, bread crumbs, frangipane, pureed potatoes or rice

pan-broiling - a dry- heat cooking method that uses conduction to transfer heat to a food resting directly on a cooking surface; no fat is used and the food remains uncovered

pan-dressed - a market form for fish in which the viscera, gills and scales are removed and the fins and tail are trimmed

pan-frying - a dry-heat cooking method in which food is placed in a moderate amount of hot fat

pan gravy - a sauce made by deglazing pan drippings from roast meat or poultry and combining them with a roux or other starch and stock

papain - an enzyme found in papayas that breaks down proteins ; used as the primary ingredient in many commercial meat tenderizers

papillote, en - a cooking method in which food is wrapped in paper or foil and then heated so that the food steams in its own moisture

parboiling - partially cooking a food in boiling or simmering liquid ; similar to blanching but the cooking time is longer

parchment paper - heat-resistant paper used throughout the kitchen for tasks such as lining baking pans, wrapping foods to be cooked en papillote and covering foods during shallow poaching

par cooking - partially cooking a food by any cooking method

paring knife - a short knife used for detail work, especially cutting fruits and vegetables; it has a rigid blade approximately 2-4 inches (5- 10 centimeters) long

Parsienne - spheres of fruits or vegetables cut with a small melon ball cutter

par stock (par level) - the amount of stock necessary to cover operating needs between deliveries

pasteurization - the process of heating something to a certain temperature for a specific period in order to destroy pathogenic bacteria

pate - traditionally, a fine savory meat filling wrapped in pastry, baked and served hot or cold; as opposed to a terrine, which was a coarsely ground and highly seasoned meat mixture baked in an earthenware mold and served cold; today, the words pate and terrine are generally used interchangeably

pate au pate - a specially formulated pastry dough used for wrapping pate when making pate en croute

pate brisee - a dough that produces a very flaky baked product containing little or no sugar; flaky dough is used for prebaked pie shells or crusts; mealy dough is a less flaky product used for custard , cream or fruit pie crusts

pate en croute - a pate baked in pastry dough such as pate au pate

pathogen - any organism that causes disease; usually refers to bacteria; undetectable by smell, sight or taste

paupiette - a thin slice of meat or fish that is rolled around a filling of finely ground meat or vegetables, then fried, baked or braised in wine or stock

paysanne - foods cut into flat square, round or triangular items with dimensions of 1/2 inch X 1/2 inch X 1/2 inch (1.2 centimeters X 1.2 centimeters X 3 millimeters)

pectin - a gelatin-like carbohydrate obtained from certain fruits; used to thicken jams and jellies

pepperoni - a hard, thin, air-dried Italian sausage seasoned with red and black pepper

persillade - (1) a food served with or containing parsley; (2) a mixture of bread crumbs, parsley and garlic used to coat meats, especially lamb

pH - a measurement of the acid or alkali content of a solution, expressed on a scale of 0 to 14.0. A pH of 7.0 is considered neutral or balanced. The lower the pH value, the more acidic the substance. The higher the pH value, the more alkaline the substance.

physical hazard - a danger to the safety of food caused by particles such as glass chips, metal shavings, bits of wood or other foreign matter

pickle - (1) to preserve food in a brine or vinegar solution; (2) food that has been preserved in a seasoned brine or vinegar, especially cucumbers. Pickled cucumbers are available whole, sliced, in wedges, or chopped as a relish, and may be sweet, sour, dill- flavored or hot and spicy.

pigment - any substance that gives color to an item

poaching - a moist-heat cooking method that uses convection to transfer heat from a hot (approximately 160°F-180°F [71°C-82°C]) liquid to the food submerged in it

pomes - members of the Rosaceae family; tree fruits with a thin skin and firm flesh surrounding a central core containing many small seeds (called pips or carpels); include apples, pears and quince

ponzu – a Japanese dipping sauce traditionally made with lemon juice or rice wine vinegar, soy sauce, mirin or sake, seaweed and dried bonito flakes

pork - the meat of hogs, usually slaughtered under the age of one year

posole - also known as hominy or samp; dried corn that has been soaked in hydrated lime or lye; posole (Sp. pozole) also refers to a stew-like soup made with pork and hominy served in Mexico and

Central America

Posterior - at or toward the rear of an object or place; opposite of anterior

potentially hazardous foods - foods on which bacteria can thrive

poultry - the collective term for domesticated birds bred for eating; they include chickens, ducks, geese, guineas, pigeons and turkeys

preserve - a fruit gel that contains large pieces or whole fruits

primal cuts - the primary divisions of muscle, bone and connective tissue produced by the initial butchering of the carcass

prix fixe - French for "fixed price"; refers to a menu offering a complete meal for a set price; also known as table d'hôtel

professional cooking - a system of cooking based on a knowledge of and appreciation for ingredients and procedures

proteins - a group of compounds composed of oxygen, hydrogen, carbon and nitrogen atoms necessary for manufacturing, maintaining and repairing body tissues and as an alternative source of energy (4 calories per gram); protein chains are constructed of various combinations of amino acids

pulses - dried seeds from a variety of legumes

pumpnickel - (1) coarsely ground rye flour; (2) bread made with this flour

puree - (1) to process food to achieve a smooth pulp; (2) food that is processed by mashing, straining or fine chopping to achieve a smooth pulp

purified water - bottled water produced by distillation, reverse osmosis, deionization or suitable processes that meet governmental standards

quality grades - a guide to the eating qualities of meat-its tenderness, juiciness and flavor- based on an animal's age and the meat's color, texture and degree of marbling

quenelle - a small, dumpling-shaped portion of a mousseline forcemeat poached in an appropriately flavored stock; it is shaped by using two spoons

radiation cooking - a heating process that does not require physical contact between the heat source and the food being cooked; instead energy is transferred by waves of heat or light striking the food. Two kinds of radiant heat used in the kitchen are infrared and microwave.

raft - a crust formed during the process of clarifying consommé; it is composed of the clearmeat and impurities from the stock, which rise to the top of the simmering stock and release additional

flavors

ragout - (1) traditionally, a well-seasoned, rich stew containing meat, vegetables and wine; (2) any stewed mixture

ramekin - a small, ovenproof dish, usually ceramic

rancidity - the decomposition of fats by exposure to oxygen, resulting in off flavors and destruction of nutritive components

ratites - family of flightless birds with small wings and flat breastbones; they include the ostrich, emu and rhea

recipe - a set of written instructions for producing a specific food or beverage; also known as a formula

recovery time - the length of time it takes a cooking medium such as fat or water to return to the desired cooking temperature after food is submerged in it

red fish - a name applied to various species of fish around the world. In the United States, it generally refers to a member of the drum family found in the southern Atlantic and the Gulf of Mexico. It has a reddish-bronze skin and firm, ivory flesh with a mild flavor and a typical market weight of 2 to 8 pounds (0.9 to 3.6 kilograms); it is also known as channel bass, red drum and reel bass.

red rice - an un-milled short- or long-grain rice from the Himalayas; it has a russet-colored bran and an earthy, nutty flavor

reduction - cooking a liquid such as a sauce until its quantity decreases through evaporation. To reduce by one-half means that one-half of the original amount remains. To reduce by three-fourths means that only one-fourth of the original amount remains. To reduce au sec means that the liquid is cooked until nearly dry.

refreshing - submerging a food in cold water to quickly cool it and prevent further cooking, also known as shocking; usually used for vegetables

regional cuisine - a set of recipes based on local ingredients, traditions and practices; within a larger geographical, political, cultural or social unit, regional cuisines are often variations of one another that blend together to create a national cuisine

relish - a cooked or pickled sauce usually made with vegetables or fruits and often used as a condiment; can be smooth or chunky, sweet or savory and hot or mild

remouillage - French for "rewetting"; a stock produced by reusing the bones left from making another stock. After draining the original stock from the stockpot, add fresh mirepoix, a new sachet and enough water to cover the bones and mirepoix, and a second stock can be made. A remouillage is treated like the original stock; allow it to simmer for four to five hours before straining. A remouillage will not be as clear or as flavorful as the original stock, however. It is often used to make glazes or in place of water when making stocks.

Render - (1) to melt and clarify fat; (2) to cook meat in order to remove the fat

restaurateur - a person who owns or operates an establishment serving food, such as a restaurant

ricer - a sieve-like utensil with small holes through which soft food is forced; it produces particles about the size of a grain of rice

rillettes - meat or poultry slowly cooked, mashed and preserved in its own fat; served cold and usually spread on toast

risers - boxes (including the plastic crates used to store glassware) covered with linens, paper or other decorative items and used on a buffet table as a base for platters, trays or displays

roasting - a dry-heat cooking method that heats food by surrounding it with hot, dry air in a closed environment or on a spit over an open fire; similar to baking, the term roasting is usually applied to meats, poultry, game and vegetables

roe - fish eggs

roll cuts – see oblique cuts

rondeau - a shallow, wide, straight-sided pot with two loop handles

rondelles - disk-shaped slices

rotate stock – to use products in the order in which they were received; all perishable and semi-perishable goods, whether fresh, frozen, canned or dry, should be used according to the first in, first out (FIFO) principle

rotisserie - cooking equipment that slowly rotates meat or other foods in front of a heating element

roulade - (1) a slice of meat, poultry or fish rolled around a stuffing; (2) a filled and rolled sponge cake

round fish - fish with round, oval or compressed bodies that swim in a vertical position and have eyes on both sides of their heads; include salmon, swordfish and cod

rounding - the process of shaping dough into smooth, round balls; used to stretch the outside layer of gluten into a smooth coating

roux - a cooked mixture of equal parts flour and fat, by weight, used as a thickener for sauces and other dishes; cooking the flour in fat coats the starch granules with the fat and prevents them from lumping together or forming lumps when introduced into a liquid

rub - a mixture of fresh or dried herbs and spices ground together; it can be used dried, or it can be mixed with a little oil, lemon juice, prepared mustard or ground fresh garlic or ginger to make a wet rub

sachet d'epices; sachet - French for "bag of spices"; aromatic ingredients tied in a cheesecloth bag and used to flavor stocks and other foods; a standard sachet contains parsley stems, cracked peppercorns, dried thyme, bay leaf, cloves and, optionally, garlic

salad - a single food or a mix of different foods accompanied or bound by a dressing

salad dressing - a sauce for a salad; most are based on a vinaigrette, mayonnaise or other emulsified product

salad greens - a variety of leafy vegetables that are usually eaten raw

salamander - a small broiler used primarily for browning or glazing the tops of foods

Salsa - Spanish for "sauce"; (1) generally, a cold chunky mixture of fresh herbs, spices, fruits and/or vegetables used as a sauce for meat, poultry, fish or shellfish; (2) in Italian usage, a general term for pasta sauces

salt-curing - the process of surrounding a food with salt or a mixture of salt, sugar, nitrite-based curing salt, herbs and spices; salt-curing dehydrates the food, inhibits bacterial growth and adds flavor

sanitation – the creation and maintenance of conditions that will prevent food contamination or food-borne illness

sanitize - to reduce pathogenic organisms to safe levels

sansho - dried berries of the prickly ash tree, ground into a powder that is also known as Szechuan pepper, fagara and Chinese pepper; generally used in Japanese cooking to season fatty foods

sashimi - raw fish eaten without rice; usually served as the first course of a Japanese meal

saturated fats - fats found mainly in animal products and tropical oils; usually solid at room temperature; the body has more difficulty breaking down saturated fats than either monounsaturated or polyunsaturated fats

sauce - generally, a thickened liquid used to flavor and enhance other foods

sausage - a seasoned forcemeat usually stuffed into a casing; a sausage can be fresh, smoked and cooked, dried or hard

sautéing - a dry-heat cooking method that uses conduction to transfer heat from a hot pan to food with the aid of a small amount of hot fat; cooking is usually done quickly over high temperatures

sauteuse - the basic sauté pan with sloping sides and a single long handle

sautoir - a sauté pan with straight sides and a single long handle

savory - a food that is not sweet

scald - to heat a liquid, usually milk, to just below the boiling point

scallop - a thin, boneless slice of meat

score - to cut shallow gashes across the surface of a food before cooking

Scoville Heat Units--a subjective rating for measuring a chile's heat; the sweet bell pepper usually rates 0 units, the tabasco pepper rates from 30,000 to 50,000 units and the habanero pepper rates from 100,000 to 300,000 units

seafood - an inconsistently used term encompassing some or all of the following: saltwater fish, freshwater fish, saltwater shellfish, freshwater shellfish and other edible marine life

sear - to brown food quickly over high heat; usually done as a preparatory step for combination cooking methods

season - traditionally, to enhance flavor by adding salt; (2) more commonly, to enhance flavor by adding salt and/or pepper as well as herbs and spices; (3) to mature and bring a food (usually beef or game) to a proper condition by aging or special preparation; (4) to prepare a pot, pan or other cooking surface to prevent sticking

seasoning - an item added to enhance the natural flavors of a food without dramatically changing its taste; salt is the most common seasoning

seltzer water - a flavorless natural mineral water with carbonation, originally from the German town of Niederselters

semi a la carte--describes a menu on which some foods (usually appetizers and desserts) and beverages are priced and ordered separately, while the entree is accompanied by and priced to include other dishes such as a salad, starch or vegetable

shallow poaching - a moist-heat cooking method that combines poaching and steaming; the food (usually fish) is placed on a vegetable bed and partially covered with a liquid (cuisson) and simmered

shellfish - aquatic invertebrates with shells or carapaces

shocking - also called refreshing; the technique of quickly chilling blanched or par-cooked foods in ice water; prevents further cooking and sets colors

shortening - (1) a white, flavorless, solid fat formulated for baking or deep-frying; (2) any fat used in baking to tenderize the product by shortening gluten strands

shred - to cut into thin but irregular strips

shrinkage - the loss of weight in a food due to evaporation of liquid or melting of fat during cooking

shuck - (1) a shell, pod or husk; (2) to remove the edible portion of a food (for example, clam meat, peas or an ear of corn) from its shell, pod, or husk

sifting - shaking one or more dry substances through a sieve or sifter to remove lumps, incorporate air and mix

silver skin - the tough connective tissue that surrounds certain muscles; see Elastin

simmering - (1) a moist-heat cooking method that uses convection to transfer heat from a hot (approximately 185°F-205°F [85°C-96°C]) liquid to the food submerged in it; (2) maintaining the temperature of a liquid just below the boiling point

skim - to remove fat and impurities from the surface of a liquid during cooking

slice - to cut an item into relatively broad, thin pieces

slurry - a mixture of raw starch and cold liquid used for thickening

smoke point - the temperature at which a fat begins to break down and smoke

smoking - any of several methods for preserving and flavoring foods by exposing them to smoke; includes cold smoking (in which the foods are not fully cooked) and hot smoking (in which the foods are cooked)

smorbrod - Norwegian cold open-faced sandwiches; similarly, the Swedish term smorgasbord refers to a buffet table of bread and butter, salads, open-faced sandwiches, pickled or marinated fish, sliced meats and cheeses

soda water - a flavorless water with induced carbonation, consumed plain or used as a mixer for alcoholic drinks or soda fountain confections; also known as club soda and seltzer

soft water - water with a relatively high sodium concentration

solid pack - canned fruits or vegetables with little or no water added

soppressata - a hard, aged Italian salami, sometimes coated with cracked peppercorns or herbs

soufflé - either a sweet or savory fluffy dish made with a custard base lightened with whipped egg whites and then baked; the whipped egg whites cause the dish to puff when baked

sous-chef - a cook who supervises food production and who reports to the executive chef; he or she is second in command of a kitchen

specifications; specs - standard requirements to be followed in procuring items from suppliers

spice - any of a large group of aromatic plants whose bark, roots, seeds, buds or berries are used as a flavoring; usually used in dried form, either whole or ground

spring form pan - a circular baking pan with a separate bottom and a side wall held together with a clamp that is released to free the baked product

spring lamb - the meat of sheep slaughtered before they have fed on grass or grains

spring water - water obtained from an underground source that flows naturally to the earth's surface

squab - the class of young pigeon used in food service operations

standardized recipe - a recipe producing a known quality and quantity of food for a specific operation

staples - (1) certain foods regularly used throughout the kitchen; (2) certain foods, usually starches, that help form the basis for a regional or national cuisine and are principal components in the diet

static menu - a menu offering patrons the same foods every day

station chef - the cook in charge of a particular department in a kitchen

steak - (1) a cross-section slice of a round fish with a small section of the bone attached; (2) a cut of meat, either with or without the bone

steamer - a set of stacked pots with perforations in the bottom of each pot; they fit over a larger pot filled with boiling or simmering water and are used to steam foods; (2) a perforated insert made of metal or bamboo placed in a pot and used to steam foods; (3) a type of soft-shell clam from the East Coast; (4) a piece of gas or electric equipment in which foods are steamed in a sealed chamber

steaming - a moist-heat cooking method in which heat is transferred from steam to the food being cooked by direct contact; the food to be steamed is placed in a basket or rack above a boiling liquid in a covered pan

steel - a tool, usually made of steel, used to hone or straighten knife blades

steep - to soak food in a hot liquid in order to either extract its flavor or soften its texture

steers - male cattle castrated prior to maturity and principally raised for beef

sterilize - to destroy all living microorganisms

stewing - a combination cooking method similar to braising but generally involving smaller pieces of meat that are first blanched or browned, then cooked in a small amount of liquid that is served as a sauce

stirring - a mixing method in which ingredients are gently mixed by hand until blended, usually with a spoon, whisk or rubber spatula

stock (French fond) - a clear, un-thickened liquid flavored by soluble substances extracted from meat, poultry or fish and their bones as well as from a mirepoix, other vegetables and seasonings

strain - to pour foods through a sieve, mesh strainer or cheesecloth to separate or remove the liquid component

streusel - a crumbly mixture of fat flour, sugar and sometimes nuts and spices, used to top baked goods

subcutaneous fat - also known as exterior fat; the fat layer between the hide and muscles

submersion poaching - a poaching method in which the food is completely covered with the poaching liquid

sub-primal cuts - the basic cuts produced from each primal

sucrose - the chemical name for common refined sugar; it is a disaccharide, composed of one molecule each of glucose and fructose

sugar - a carbohydrate that provides the body with energy and gives a sweet taste to foods

sushi - cooked or raw fish or shellfish rolled in or served on seasoned rice

sweat - to cook a food in a pan (usually covered), without browning, over low heat until the item softens and releases moisture; sweating allows the food to release its flavor more quickly when cooked with other foods

sweetbreads - the thymus glands of a calf or lamb

tang - the portion of a knife's blade that extends inside the handle

tart - a sweet or savory filling in a baked crust made in a shallow, straight-sided pan without a top crust

tartlet - a small, single-serving tart

taste - the sensations, as interpreted by the brain, of what we detect when food, drink or other substances come in contact with our taste buds

tempeh - fermented whole soybeans mixed with a grain such as rice or millet; it has a chewy consistency and a yeasty, nutty flavor

temper - to heat gently and gradually; refers to the process of slowly adding a hot liquid to eggs or other foods to raise their temperature without causing them to curdle

temperature danger zone - the broad range of temperatures between 41°F and 135°F (5°C and 57°C) at which bacteria multiply rapidly

tempering - a process for melting chocolate during which the temperature of the cocoa butter is carefully stabilized; this keeps the chocolate smooth and glossy

terraine - (1) traditionally, a loaf of coarse forcemeat cooked in a covered earthenware mold and without a crust; today, the word is used interchangeably with pate; (2) the mold used to cook such items, usually a rectangle or oval shape and made of ceramic

thickening - agents- ingredients used to thicken sauces; include starches (flour, cornstarch and arrowroot), gelatin and liaisons

timbale - (1) a small pail- shaped mold used to shape foods; (2) a preparation made in such a mold

toque (tuke) - the tall white hat worn by chefs

torchon - French for a cloth or towel, such as a dishcloth. The term is sometimes used to refer to dishes in which the item has been shaped into a cylinder by being wrapped in a cloth or towel.

tossed salad - a salad prepared by placing the greens, garnishes and salad dressing in a large bowl and tossing to combine

total recipe cost - the total cost of ingredients for a particular recipe ; it does not reflect overhead, labor, fixed expenses or profit

turner - to cur into football-shaped pieces with seven equal sides and blunt ends

toxins - by-products of living bacteria that can cause illness if consumed in sufficient quantities

tranche - an angled slice cut from fish fillets

trans fats - a type of fat created when vegetable oils are solidified through hydrogenation

tripe - the edible lining of a cow's stomach

truffles - (1) flavorful tubers that grow near the roots of oak or beech trees; (2) rich chocolate candies made with ganache

truss - to tie poultry with butcher's twine into a compact shape for cooking

tube pan - a deep round baking pan with a hollow tube in the center

unit cost - the price paid to acquire one of the specified units

univalves - single-shelled mollusks with a single muscular foot, such as abalone

unsaturated fats - fats that are normally liquid (oils) at room temperature; they may be monounsaturated (from plants such as olives and avocados) or polyunsaturated (from grains and seeds such as corn, soybeans and safflower as well as from fish)

vacuum packaging - a food preservation method in which fresh or cooked food is placed in an airtight container (usually plastic). Virtually all air is removed from the container through a vacuum process, and the container is then sealed.

vanilla custard sauce - also known as *crème anglaise*; a stirred custard made with egg yolks, sugar and milk or half-and-half and flavored with vanilla; served with or used in dessert preparations

vanillin - (1) whitish crystals of vanilla flavor that often develop on vanilla beans during storage; (2) synthetic vanilla flavoring

variety - the result of breeding plants of the same species that have different qualities or characteristics; the new **variety meats** - see offal

veal - the meat of calves under the age of nine months

veloute - a leading sauce made by thickening a white stock (fish, veal, or chicken) with roux

venison - flesh from any member of the deer family, including antelope, elk, moose, reindeer, red- tailed deer, white-tailed deer, mule deer and axis deer

vent - (1) to allow the circulation or escape of a liquid or gas; (2) to cool a pot of hot liquid by setting the pot on blocks in a cold water bath and allowing cold water to circulate around it

vinaigrette - a temporary emulsion of oil and vinegar seasoned with salt and pepper

vinegar - a thin, sour liquid used as a preservative, cooking ingredient and cleaning solution

viniculture - the art and science of making wine from grapes

vintner - a winemaker

viruses - the smallest known form of life; they invade the living cells of a host and take over those cells' genetic material, causing the cells to produce more viruses; some viruses can enter a host through the ingestion of food contaminated with those viruses

viscera - internal organs

vitamins - compounds present in foods in very small quantities ; they do not provide energy but are essential for regulating body functions

viticulture - the art and science of growing grapes used to make wines; factors considered include soil, topography (particularly, sunlight and drainage) and microclimate (temperature and rainfall)

vol-au-vents - deep, individual portion-sized puff pastry shells, often shaped as a heart, fish or fluted circle; they are filled with a savory mixture and served as an appetizer or main course

volume - the space occupied by a substance; volume measurements are commonly expressed as liters, teaspoons, tablespoons, cups, pints and gallons

wash - a glaze applied to dough before baking; a commonly used wash is made with whole egg and water

weight - the mass or heaviness of a substance; weight measurements are commonly expressed as grams, ounces and pounds

whetstone - a dense, grained stone used to sharpen or hone a knife blade

whipping- a mixing method in which foods are vigorously beaten in order to incorporate air; a whisk or an electric mixer with its whip attachment is used

white stew - see fricassee and blanquette

white stock - a light-colored stock made from chicken, veal, beef or fish bones simmered in water with vegetables and seasonings

whole butter- butter that is not clarified, whipped or reduced-fat

wine - an alcoholic beverage made from the fermented juice of grapes; may be sparkling (effervescent) or still (non-effervescent) or fortified with additional alcohol

work section - see work station

work station - a work area in the kitchen dedicated to a particular task, such as broiling or salad making; workstations using the same or similar equipment for related tasks are grouped together into work sections

yeasts - microscopic fungi whose metabolic processes are responsible for fermentation; they are used for leavening bread and in cheese, beer and wine making

yield - the total amount of a product made from a specific recipe; also , the amount of a food item remaining after cleaning or processing

yield grades - a grading program for mem that measures the amount of usable meat on a carcass

zest - the colored outer portion of the rind of citrus fruit; contains the oil that provides flavor and aroma

Appendix

PROFESSIONAL ASSOCIATIONS

American Culinary Association (ACF), www.acfchefs.org
 American Dietetic Association (ADA), www.eatright.org
 American Hotel and Lodging Association (AHLA), www.ahla.org
 American Institute of Baking (AIB), www.aibonline.org
 American Institute of Wine and Food (AIWF), www.aiwf.org
 American Personal Chef Association (APCA), www.personalchef.com
 American Society for Healthcare Food Service Administrators (ASHFSA), www.ashfsa.org
 Black Culinarian Alliance (BCA), www.blackculinarians.com
 Bread Bakers Guild of America, www.bbga.org
 Club Managers Association of America (CMAA), www.cmaa.org
 Confrerie de la Chaine des Rotisseurs, www.chaineus.org
 Dietary Managers Association (DMA), www.dmaonline.org
 Foodservice Consultants Society International (FCSI), www.fcsi.org
 Foodservice Educators Network International (FENI), www.feni.org
 Food Truck Operation, Foodtruckoperators.com
 Institute of Food Technologists (IFT), www.ift.org
 International Association of Culinary Professionals (IACP), www.iacp.com
 International Caterers Association, www.icacater.org
 International Council of Cruise Lines, www.iccl.org
 International Council on Hotel and Restaurant Institutional Education (ICHRIE), www.chrie.org
 International Food Service Executives Association (IFSEA), www.ifsea.com
 International Foodservice Manufacturers Association (IFMA), www.ifmaworld.com
 International Inflight Food Service Association (IFSA), www.ifsanet.com
 Les Dames d'Escoffier International, www.ldei.org
 National Association of College and University Foodservice (NACUFS), www.nacufs.org
 National Association of Foodservice Equipment Manufacturers (NAFEM), www.nafem.org
 National Association for the Specialty Food Trade (NASFT), www.fancyfoodshows.com
 National Food Processors Association, www.nfpa-food.org
 National Ice Carving Association (NICA), www.nica.org
 National Restaurant Association, www.restaurant.org
 National Society for Healthcare Foodservice Management (HFM), www.hfm.org
 Research Chefs Association (RCA), www.culinology.com
 Retailer's Bakery Association (RBA), www.rbanet.com
 School Nutrition Association (SNA), www.schoolnutrition.org
 Societe Culinaire Philanthropique, www.societeculinaire.com
 Society for Foodservice Management (SFM), www.sfm-online.org
 United States Personal Chef Association (USPCA), www.uspca.com
 Women's Foodservice Forum (WFF), www.womensfoodserviceforum.com
 Women Chefs and Restaurateurs, www.womenfhefs.org

INDUSTRY RESOURCES

American Culinary Federation Beef Cuts Poster

https://www.acfchefs.org/download/documents/resources/trends/Beefcuts_Poster.pdf

Agri Beef www.agrib Beef.com/education/

American Lamb Board www.americanlamb.com/chefs-corner/curriculamb/

Butterball Foodservice www.butterballfoodservice.com

Maple Leaf Farms www.mapleleaffarms.com

National Cattlemen's Beef Association

National Pork Board www.porkfoodservice.org

National Turkey Federation www.eatturkey.org

North American Meat Institute www.meatinstitute.org

Seafood

Alaska Seafood Marketing Institute www.alaskaseafood.org

Bureau of Seafood and Aquaculture www.freshfromflorida.com/Recipes/Seafood

National Aquaculture Association thenaa.net

Produce

American Egg Board www.aeb.org

Apricot Producers of California www.califapricot.com

Avocados from Mexico foodservice.avocadosfrommexico.com

California Cling Peach Board www.calclingpeach.com

California Cling Peach Board www.calclingpeach.com

California Avocado Commission www.californiaavocado.com

California Dried Plum Board www.californiadriedplums.org

California Endive www.endive.com

California Fig Advisory Board www.californiafigs.com

California Kiwifruit Commission www.kiwifruit.org

California Pear Advisory Board www.calpear.com

California Raisin Marketing Board * Dietary Tool Kit www.calraisins.org

California Strawberry Commission www.calstrawberry.com

California Table Grape Commission www.tablegrape.com

Cherry Marketing Institute www.choosecherries.com

Concord Grape Association www.concordgrape.org

Cranberry Institute www.cranberryinstitute.org

Cranberry Marketing Committee*Tool Kit www.uscranberries.com

Dole Packaged Foods *Cost Savings Calculator www.dolefoodservice.com

Florida Dept. of Citrus www.floridajuice.com

Hass Avocado Board *Tool Kit www.avocadocentral.com
 Idaho Potato Commission *Cost & Sizing Guides www.idahopotato.com
 Leafy Greens Council www.leafy-greens.org
 Leaf Greens Marketing Association www.lgma.ca.gov/
 Louisiana Sweet Potato Commission www.sweetpotato.org
 Mushroom Council www.mushroomcouncil.org
 National Honey Board *Teacher Guide www.honey.com
 National Mango Board *Lesson Plans www.mango.org
 National Onion Association*Lesson Plans www.onions-usa.org
 National Processed Raspberry Council www.redrazz.org
 National Watermelon Promotional Board www.watermelon.org
 NC Sweet Potato Commission www.ncsweetpotatoes.com
 New York Apple Association www.nyapplecountry.com
 North American Blueberry Council www.blueberry.org
 Northwest Cherry Growers www.nwcherries.com
 Olives from Spain olivesfromspain.us/
 Oregon Raspberries and Blackberries www.oregon-berries.com
 Pacific Northwest Canned Pear Service www.eatcannedpears.com/
 Pear Bureau Northwest www.usapears.com
 Pomegranate Council www.pomegranates.org
 Potatoes USA www.PotatoGoodness.com
 Produce for Better Health Foundation www.5aday.com
 The Soyfoods Council www.thesoyfoodscouncil.com
 U.S. Apple Association www.usapple.org
 USA Rice Federation www.menurice.com
 Washington Red Raspberry Commission www.red-raspberry.org
 Washington State Apple Commission www.bestapples.com
 Washington State Potato Commission www.potatoes.com
 Wheat Foods Council *Tool kits and classroom materials www.wheatfoods.org
 Wild Blueberry Assn. of North America www.wildblueberries.com

Oil, Spices and Seasonings

North American Olive Oil Association *Classroom materials www.aboutoliveoil.org

Nuts and Legumes

Almond Board of California*Tool Kit www.almonds.com/food-professionals
 American Pistachio Growers www.americanpistachios.org/
 California Walnut Board www.walnuts.org
 National Peanut Board www.nationalpeanutboard.org

Dairy Products

Emmi Roth USA *Pairing information us.emmi.com/en

Real CA Milk www.realcaliforniamilk.com/foodservice/

Wisconsin Milk Marketing Board Pairing guides www.wisdairy.com

Specialty Foods

New York Wine & Grape Foundation www.nywine.com

Popcorn Board www.popcorn.org

Baking Ingredients

Guittard Chocolate Company www.guittard.com

Bay State Milling Co. www.baystatemilling.com

Manufacturing/Distributors

Barilla America www.barilla.com/en-us

Bay State Milling Co.

www.baystatemilling.com

Dole Packaged Foods *Cost Savings Calculator www.dolefoodservice.com

Knouse Foods www.knousefoodservice.com

SYSCO www.sysco.com

Unilever Food Solutions www.unileverfoodsolutions.us

Verterra Dinnerware www.verterra.com

Measurement and conversion charts

Formulas for Exact measurement

	WHEN YOU KNOW:	MULTIPLY BY:	TO FIND:
Mass (weight)	Ounces	28.35	grams
	Pounds	0.45	kilograms
	Grams	0.035	ounces
	Kilograms	2.2	pounds
Volume (capacity)	teaspoons	5.0	milliliters
	tablespoons	15.0	milliliters
	fluid ounces	29.57	milliliters
	cups	0.24	liters
	pints	0.47	liters
	quarts	0.95	liters
	gallons	3.785	liters
	milliliters	0.034	fluid ounces
Temperature	Fahrenheit	5/9 (after subtracting 32)	Celsius
	Celsius	9/5 (then add 32)	Fahrenheit

Rounded Measurement for Quick Reference

1 oz.		= 30 g
4 oz.		= 120 g
8 oz.		= 240 g
16 oz.	= 1 lb.	= 480 g
32 oz.	= 2 lb.	= 960 g
36 oz.	= 2¼ lb.	= 1000 g (1 kg)
1/4 tsp.	= 1/24 fl. oz.	= 1 ml
½ tsp.	= 1/12 fl. oz.	= 2 ml
1 tsp.	= 1/6 fl. oz.	= 5 ml
1 Tbsp.	= 1/2 fl. oz.	= 15 ml
1 C.	= 8 fl. oz.	= 240 ml
2 c. (1 pt.)	= 16 fl. oz.	= 480 ml
4 c. (1 qt.)	= 32 fl. oz.	= 960 ml
4 qt. (1 gal.)	= 128 fl. oz.	= 3.75 lt
32°F	= 0°C	
122°F	= 50°C	
212°F	= 100°C	

Conversion Guidelines

1 gallon	4 quarts 8 pints 16 cups (8 fluid ounces) 128 fluid ounces
1 fifth bottle	approximately 1 ½ pints or exactly 26.5 fluid ounces
1 measuring cup	8 fluid ounces (a coffee cup generally holds 6 fluid ounces)
1 large egg white	1 ounce (average)
1 lemon	1 to 1 ¼ fluid ounces of juice
1 orange	3 to 3½ fluid ounces of juice

Scoop Sizes

Scoop Number	Level Measure
6	2/3 cup
8	1/2 cup
10	2/5 cup
12	1/3 cup
16	1/4 cup
20	3 1/5 tablespoons
24	2 2/3 tablespoons
30	2 1/5 tablespoons
40	1 3/5 tablespoons

The number of the scoop determines the number of servings in each quart of a mixture: for example, with a No. 16 scoop, one quart of mixture will yield 16 servings.

Ladle Sizes

Size	Portion of a Cup	Number per Quart	Number per Liter
1 fl. oz.	1/8	32	34
2 fl. oz.	1/4	16	17
2 2/3 fl. oz.	1/3	12	13
4 fl. oz.	1/2	8	8.6
6 fl. oz.	3/4	5 1/3	5.7

Canned Goods

SIZE	NO. OF CANS PER CASE	AVERAGE WEIGHT	AVERAGE NO. CUPS PER CAN
No. ¼	1 & 2 doz.	4 oz.	1/2
No. ½	8	8 oz.	1
No. 300	1 & 2 doz.	14 oz.	1 3/4
No. 1 tall (also known as 303)	2 & 4 doz.	16 oz.	2
No. 2	2 doz.	20 oz.	2 1/2
No. 2½	2 doz.	28 oz.	3 1/2
No. 3	2 doz.	33 oz.	4
No. 3 cylinder	1 doz.	46 oz.	5 2/3
No. 5	1 doz.	3 lb. 8 oz.	5 1/2
No. 10	6	6 lb. 10 oz.	13

