



Culinary Review - Seafood

Many years ago fish was only available to people in coastal, lake or river regions. With the development of efficient refrigerated transportation and some high quality flash freezing processes, seafood is more readily available. Seafood's popularity has flourished with the increase in availability, quality and selection of seafood products. This has led to the creation of many new and exciting seafood recipes and dishes. Seafood is continuing to pull away from the old "tuna casserole" image.

Fish is a very different subject from meats. Meats come from a limited number of animals. The area of an animal from which a cut was taken is the difference between meats. Fish have a limited number of different cuts, but the number of species and their varieties are great. For this reason, only the basic principles of the structure, handling and cooking of seafood are discussed here.

Basic Composition of Seafood

Seafood, just like meat and poultry, is composed of protein, water, fat, vitamins and minerals. The big difference between meat and fish is the connective tissue.

- ❖ Seafood contains very little connective tissue
- ❖ Seafood cooks very rapidly. Even at low heat the protein in seafood coagulates quickly
- ❖ Seafood is naturally tender

Toughness in seafood occurs when seafood is exposed to high heat for too long. Seafood is prepared using moist heat, not to break down the connective tissue, but to preserve the moisture. Cooked fish becomes very delicate and must be handled carefully to prevent it from falling apart.

Handling and Storage

Seafood is the most perishable food product that a chef will handle. Ideally, seafood should be cooked and served on the day of purchase. Shellfish is marketed fresh, frozen and even live. They deteriorate rapidly after harvesting. In some cases, it is preferable to use a good frozen product over a "fresh" product that has been out of the water too long.

Fish can be refrigerated for 1 to 2 days, but no longer. When you are storing fresh fish it is best to keep it refrigerated at a fairly cold temperature approximately 30-34° F. Keep the fish container sealed so that odors will not be transferred to other foods and to prevent them from drying out. Place the fish in a container or location that will protect the fish from being bruised or crushed. Fish may be wrapped and stored in the freezer. Lean fish can be stored up to 6 months in the freezer while oily fish will only last up to 3. Frozen fish should be thawed in the refrigerator overnight.

Cooked fish also can be frozen and used later; however, this is not recommended for best flavor. The best method of storing fish is on crushed ice. Fish should be wrapped (if cut) and not wrapped (if whole) and placed in crushed ice in a pan or container that will drain the melted ice into a drain or drip pan. Be sure that the fish never sits in water or it will become waterlogged and the flesh will be ruined.

Fish comes from either freshwater or saltwater. With the increased popularity of sushi, it is important to be aware of some of the dangers accompanying raw seafood. Freshwater fish come from freshwater lakes and streams. These fish can carry parasites that can be harmful to humans. For this reason, freshwater fish never should be eaten raw or used for sushi. Cooking to the proper doneness by any method will kill any parasites present.



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Saltwater fish do not carry parasites that are harmful to humans because the parasites cannot survive in the flesh of saltwater fish. Saltwater fish are generally safe to eat raw as long as they were caught in non-polluted waters. (The exceptions are salmon and swordfish.)

Major Groups of Seafood

Seafood or fish is broken down into two groups: Finfish and shellfish.

- ❖ Finfish have fins and internal skeletons
- ❖ Shellfish have no internal bone structure, but have external shells

Since the two groups are very different, they will be discussed separately.

Finfish

Composition and Structure

Finfish can be classified as either round or flat, based on their skeletal structure. Roundfish can be cooked whole or cut off the bone into two fillets. Larger roundfish, such as salmon, can be cut crosswise into steaks. Large fillets can be sliced crosswise into several smaller fillets. Flatfish, such as flounder, cannot be satisfactorily cut into steaks or slices. Flatfish are cooked whole or cut from the bone into fillets, two from the top and two from the bottom.

Fish are classified as either lean or oily based on their fat content. Lean fish have 5 percent or less fat in the total body substance. Lean fish generally have a mild flavor and firm white flesh. Oily fish contain 5 to 50 percent body fat. Their flesh is strong tasting, richer and less white than that of lean fish.

Selecting and Handling Fish

Before purchasing or using any fish, always check for freshness. Fresh fish almost always will be free from odor. If whole, it should have firm flesh, clear eyes and shiny scales that are not loose. The gills will be pink or red. The skin or flesh should never be sticky or slimy.

When you are ready to prepare any stored fish, rinse it under cold running water and pat dry.

Filets or steaks also should be relatively free of strong "fish odor," be firm and not be slimy. A personal chef should check for, and remove, any bones in steaks or filets for their clients.

Frozen, Canned and Processed Fish

Frozen fish is used widely in the food service industry. Check for quality. Look to make sure that the product has not been received thawed, and that it doesn't look like it has been thawed and refrozen. The fish packaging and wrapping should be intact and in good condition. The product should be free from freezer burn.

Avoid fillets that are yellowing or browning around the edges. Fillets should have a natural sheen. If the product is sealed using a thin layer of ice, be sure that it has not melted or evaporated. Frozen fish should be stored at 0°F.

If you are using canned fish, check for swollen or damaged cans. If they are, return or discard them. Fish should be removed from open cans, placed in sealed containers and refrigerated. It will keep 2 or 3 days.



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Basic Principles of Cooking Fish

Cooking fish properly takes timing, skill and experience. Fish can be over-cooked very easily and become tough, dry and chewy. For this reason you must know precisely when the fish is correctly "done."

"Flaking" is the breaking apart of the fish along natural separations when cooked. Many people believe that fish flake when done. This does not mean the fish is falling apart. Look for these signs to determine when the fish is done.

- ❖ The fish is just beginning to flake, but does not fall apart
- ❖ The bones (if any) are separating from the flesh and are no longer pink
- ❖ The flesh has turned from translucent to opaque

The color varies according to the type of fish prepared. A very general "rule of thumb" that many cooks use is to cook fish 10 minutes for every inch of thickness (at its thickest point). This is just a general guideline and will vary based on the type of fish and the method used to cook it. You carefully should watch your fish during cooking. Remember that over-cooking is the major problem, and complaint, where fish is concerned.

Fat in Fish

One of the major differences between types of fish is fat content. Lean fish, such as cod, sole, bass and halibut, have almost no fat and can easily be over-cooked. Moist heat cooking methods are best for these fish. Poaching works exceptionally well. Dry heat methods will work with these fish, but you must be careful not to dry them out. Basting the fish with butter or oils can help retain moisture. Sautéing or deep-frying fish in fat can add flavor and maintain moistness.

Fish with a higher fat content (oily) can be cooked using the same methods as lean fish. The difference is that the oily fish are better suited for dry heat methods, because these dry methods actually cook out some of the fat without drying out the fish. Poaching generally is done only with oily fish that have a lower fat content, such as salmon. When cooking fish with a higher fat content in oil, be sure to drain them, if necessary, to avoid excessive oiliness.

Cooking Methods for Fish

Baking

Fat fish are best for baking. Great care must be taken for lean fish to be baked without having the flesh dry out. Large fish or fish pieces should be baked at a lower temperature, while small thin pieces should be cooked at higher heats. Cooking times will vary greatly when baking fish depending on the type, size and temperature of the oven used.

Broiling

Broiled and grilled fish are becoming very popular. The problem with this type of cooking is that the fish needs to be served immediately after cooking and, as a personal chef, this is generally not an option for your clients. As with baking, fish with a higher fat content are better to use because the higher heats used tend to dry fish out. If you are using a leaner fish, handle it carefully. Leaner fish tend to be more delicate and can have trouble staying together and falling apart. If your fish has an attractive skin, it can be left on and used in the presentation.



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Sautéing / Pan-frying

Classically, fish that is sautéed or pan-fried is first dredged with flour and cooked in clarified butter or oil. Because many fish are so delicate, they do not lend themselves to many of these preparations. These methods are used for cooking lean fish because they supply the fat lacking in the fish. Fish often are breaded or coated before cooking to help hold the fish together and create a nice color before the fish can overcook.

Brown the most attractive side first. With most fish, the attractive side is the bone side, not the skin side.

Deep-frying

Deep-frying is generally not used by personal chefs because the fish must be served immediately and is too involved for most clients to manage.

Poaching and Simmering

Poaching and simmering are great methods for cooking both lean and fatty fish. Poaching liquids often contain flavoring ingredients such as herbs and spices, white wine, lemon juice or a simple mirepoix. Start small pieces of fish in hot water to preserve flavors. Start larger pieces in cold liquid to help prevent the piece from splitting.

Fish also can be cooked in a steamer with great success. Cooking fish en papillote is a method that allows the fish to be cooked in its own steam. This method surrounds the fish with a parchment paper wrap or foil wrap that seals in the moisture when the fish is baked. The "bag" can have herbs, lemon or a simple mirepoix added to it to give the fish even more flavor.

Shellfish

All shellfish fall into one of two categories: mollusks and crustaceans. Mollusks are composed of univalves, bivalves and cephalopods. Crustaceans are lobster, shrimp and crabs.

Mollusks

Oysters

Oysters live in shallow, temperate waters. They have rough, gray, irregular shells. Their soft briny flesh is very delicate and contains a high percentage of water. This shellfish varies in color from creamy beige to pale gray.

Oysters are sold live (in the shell), shucked (in jars) or smoked (packed in tins). Oysters should be purchased as fresh as possible. The smaller the oyster is (for its species) the more tender it will be. Shucked oysters should be plump, uniform in size with a good color, smell fresh and be packaged in a clear, not cloudy, liquor. Liquor is the term that refers to the oyster's natural juices.

Clams

The two main varieties of clams are hard-shell and soft-shell.

Hard-shelled clams are found on the East Coast (where they're also called by the Indian name Quahog) and come in three sizes: littleneck clams, cherrystone clams and chowder clams. When buying hard-shell clams in the shell, make sure the shells are tightly closed. If a shell is slightly open, tap it lightly. If it doesn't snap shut, the clam is dead and should be discarded. To test a soft-shell clam, lightly touch its neck. If it moves, it's alive.



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The guideline for buying shucked clams is plumpness and clear liquid. Store live clams up to 2 days in a 40°F refrigerator. Refrigerate shucked clams up to 4 days.

Clams can be cooked in a variety of ways, including steaming and baking. All clams should be cooked gently to prevent toughening. Clams are high in protein and contain fair amounts of calcium and iron.

Scallops

Scallops have two beautiful fan-shaped shells that are often used as containers in which to serve dishes such as Coquilles St. Jacques. Though the entire scallop, including the roe (an orange colored flesh relished by many Europeans) is edible, the portion most commonly found in U.S. markets is the muscle that hinges the two shells. There are many scallop species, but in general they're classified into two broad groups: bay scallops and sea scallops.

Because scallops perish quickly out of water, they're usually sold shucked. All fresh scallops should have a sweet smell and a fresh, moist sheen. Scallops should be refrigerated immediately after purchase and used within a day or two. Frozen scallops are generally available year-round, either breaded or plain.

Scallops benefit from brief cooking and are suitable for a variety of preparation methods, including sautéing, grilling, broiling and poaching. They're also used in soups, stews and salads. Scallops can be eaten raw in dishes like ceviche and sushi (although not recommended).

Cephalopods

Squid

Squid is a ten-armed cephalopod. Squid meat has a firm, chewy texture and mild, somewhat sweet flavor. Squid also is known as calamari. Squid are rich in protein and phosphorus.

When buying fresh squid choose those that are small and whole with clear eyes and an ocean-fresh fragrance. They should be refrigerated, airtight, for no more than a day or two.

Squid can be pan-fried, baked, boiled, stir-fried or coated with batter and deep-fried. The cooking time should always be short, since the texture of squid becomes rubbery when overcooked.

Octopus

Octopus (or devilfish) has been known to reach sizes up to 50 feet. However, the majority reaches only 1 to 2 feet (tentacles extended) and weigh about 3 pounds. Its rich diet of clams and scallops gives it highly flavorful meat that, though rubbery, is extremely popular in Japan and the Mediterranean countries.

Pre-dressed fresh and frozen octopus is available in many supermarkets and specialty fish markets. As with most species, those that are younger and smaller are tenderer. The eight tentacles and the body to which they're attached are edible, but the eyes, mouth area and viscera are discarded. Fresh octopus should smell sweet, not fishy. It should be refrigerated immediately and eaten within 1 to 2 days.

Frozen octopus and squid should be thawed slowly in the refrigerator.



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Crustaceans

Crustaceans are shellfish that have a segmented body and paired, jointed limbs. They include lobsters, shrimp and crab.

Lobsters

Lobsters are the kings of the crustacean family and the most prized of the crustacean, if not just the most expensive. There are two varieties of lobsters taken in American waters:

- ❖ Rock Lobsters: the warm water, spiny lobster found along the coasts of Florida and Southern California, Mexico, Australia, New Zealand and South Africa
- ❖ American lobster (or Maine lobster): the cold water lobster found in the Atlantic around New England and Southern Canada

Cold-water lobsters generally have more flavor and a firmer, sweeter flesh. Warm water lobsters are less prized and usually less expensive.

Live lobsters have a mottled shell splotted with various colors, generally greenish blue and reddish brown. The shell turns vivid red only after the lobster is cooked.

Because bacteria form quickly in a dead lobster, it's important that it be alive when you buy it. To make sure, pick up the lobster. If its tail curls under the body, it's alive. This test is especially important with lobsters that have been stored on ice because they're so sluggish that it's sometimes hard to see movement.

Lobsters are poached, steamed, baked and grilled, and may be eaten either hot or cold. Cold lobster is served as a cocktail or a salad with mayonnaise or vinaigrette. Hot lobster often is served in the shell with melted butter and lemon. The shells are used to flavor bisques and sauces while the meat is used in soups, casseroles, soufflés and sautés.

Shrimp

This delicious crustacean is an American favorite. Most of the shrimp in the United States comes from bordering waters, notably the Atlantic and Pacific Oceans and the Gulf Coast.

There are hundreds of shrimp species, most of which can be divided into two broad classifications: warm-water shrimp and cold-water shrimp. As a broad and general rule, the colder the water, the smaller and more succulent the shrimp. Shrimp come in a variety of colors including reddish to light brown, pink, deep red, grayish-white, yellow, gray-green and dark green. Some have color striations or mottling on their shells. Because of a heat-caused chemical change, most shrimp shells change color (such as from pale pink to bright red or from red to black) when cooked.

Shrimp are marketed according to size (number per pound), but market terms vary greatly from region to region and from market to market. Keeping that variance in mind, the general size categories into which shrimp fall on the next chart.



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| Shrimp Size Category | Approximate # per pound |
|----------------------|-------------------------|
| Colossal | 10 or less |
| Jumbo | 11-15 |
| Extra-large | 16-20 |
| Large | 21-30 |
| Medium | 31-35 |
| Small | 36-45 |
| Miniature | about 100 |

In the United States, jumbo and colossal shrimp are commonly called “prawns,” though the prawn is, in fact, different species. Though there are slight differences in texture and flavor, the different sizes (except the miniatures) usually can be substituted for each other.

As a rule, the larger the shrimp the larger the price. In general, one pound of whole, raw shrimp yields 1/2 to 3/4 pound of cooked meat. Shrimp are available year-round and are usually sold without head and sometimes legs. When raw and unshelled, they're referred to as “green shrimp.” Many forms of shrimp are found in the marketplace: shelled or unshelled, raw or cooked, and fresh or frozen. Raw shrimp should feel firm and smell sweet, with no hint of ammonia. Cooked, shelled shrimp should look plump and succulent.

Before storing fresh, uncooked shrimp, rinse them under cold, running water and drain thoroughly. Tightly cover and refrigerate for up to 2 days. Cooked shrimp can be refrigerated for up to 3 days. Freeze shrimp for up to 3 months. Thaw frozen shrimp in its freezer wrapping overnight in the refrigerator, or place the package in cold water until defrosted.

Crab

Crab includes a large variety of crustaceans with ten legs. The front two legs have pincers. Crabs are noted for their sweet, succulent meat and are the second most popular shellfish (after shrimp) in the United States. There are fresh and saltwater crabs, the latter being the most plentiful.

The pride of the Pacific coast is the Dungeness crab. Dungeness crab can be found all the way from Alaska to Mexico. This large crab can range from 1 to almost 4 pounds. Its pink flesh is succulent and sweet.

From the North Pacific comes the king crab. King crab is also known as Alaskan or Japanese King crab. The delicately flavored meat is snowy white and edged with a beautiful bright red. Because the species is rapidly dwindling, the catch of king crab is rigidly quota-controlled.

All live crabs should be used on the day they're purchased. Refrigerate them until just before cooking. Cook raw crabmeat within 24 hours after the crab dies.



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Crabmeat is also available frozen, canned or pasteurized (heated in cans at a temperature high enough to kill bacteria, but lower than that used in canning). Pasteurized crabmeat can be stored unopened in the refrigerator for up to 6 months and should be used within 4 days of opening. Whole crabs and crabmeat can be cooked in a variety of ways, including frying, steaming, broiling or in soups, gumbos or crab cakes.

Soft-shelled crab is a term describing a growth state of the crab, during which time it casts off its shell in order to grow one that's larger. Soon after the crab sheds its shell, its skin hardens into a new one. During those few days before the new shell hardens, these crustaceans are referred to as "soft-shell" crabs. In the United States, the blue crab is the species most commonly eaten in its soft-shell state. They are always sold whole. Soft-shelled crabs are in season from April to mid-September (with a peak in June and July).