Fish & Shellfish Handbook

Alabama Cooperative Extension Service
Auburn University, Alabama 36849

FISH AND SHELLFISH HANDBOOK

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The Alabama Cooperative Extension Service

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THE ALABAMA FISH AND SHELLFISH INDUSTRY

Fish and shellfish are big business in Alabama! In 1979, Alabama's seafood landings ranked 13th in the nation in dollar value. This was the value of the seafood when it reached Alabama docks, before any processing increased its value. Our two major ports are Bayou La Batre, which ranked 9th nationally and Bon Secour-Gulf Shores which was 27th.

Fishermen landed more than 33 million pounds of seafood products valued at nearly $50 million at dockside in these two ports during 1979. Based on these figures, it is estimated that the economic impact of the Alabama seafood industry on the state and the nation was almost $200 million.

The most valuable seafood product landed in Alabama is shrimp which accounts for 90 percent of the dockside dollar value of seafood landed in the state. Brown shrimp make up the majority of the catch, but white and pink shrimp are also landed.

Freshwater fish also contribute significantly to fish supplies in the state. Many fish are caught by commercial and sport fishermen. Others are grown by fish farmers.

Commercial fishermen harvest several valuable fish species from Alabama rivers and reservoirs. Sportfishermen fished on over 35 million occasions in Alabama's rivers, creeks, lakes and ponds during 1980. Products of these sportfishing trips were consumed in large quantities by fishermen and their families.

More than 20 million pounds of farm-raised catfish were produced by Alabama growers in 1979. Value to the farmer reached $13 million and Alabama ranked second in the U.S. in farm-raised catfish production.

Fish and shellfish harvested by Alabama fishermen include oysters, blue crab, redfish, sea trout, snapper, flounder, mullet, catfish, bream, bass, crappie and drum. Many other species of finfish are caught by both commercial and sport fishermen and find their way onto dinner tables throughout Alabama.

Though many Alabamians do not live near water, improved methods of harvesting, processing and marketing fish products make it possible to purchase top quality fish and shellfish in almost any area of the state.

II. POPULAR ALABAMA FISH AND SHELLFISH

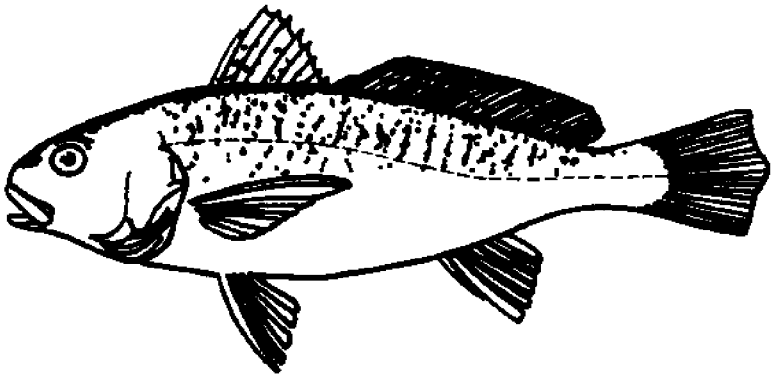
SPECIES IDENTIFICATION - ALABAMA SALTWATER FINFISH

ATLANTIC CROAKER

This fish gets its name "croaker" from the distinctive drumming croak it produces at various times. Biologists know that the croaker's sound production is made voluntarily, but they still know little about its function. The sound is caused by the vibration of the strong muscles against the swim bladder, which acts as a resonating chamber. Croaking increases during spawning season and is also heard if the fish is touched or pursued.

Croaker are found along both the Atlantic Coast and the Gulf of Mexico. They are most abundant in the Chesapeake Bay and the Mississippi River Delta. Although croaker was once very abundant in the Gulf, the amount caught in recent years has been declining.

The croaker is a bottom-feeding, carnivorous fish and lives on a diet of shellfish and other smaller forms of marine life. They range in size from $\frac{1}{2}$ to 3 pounds at maturity.



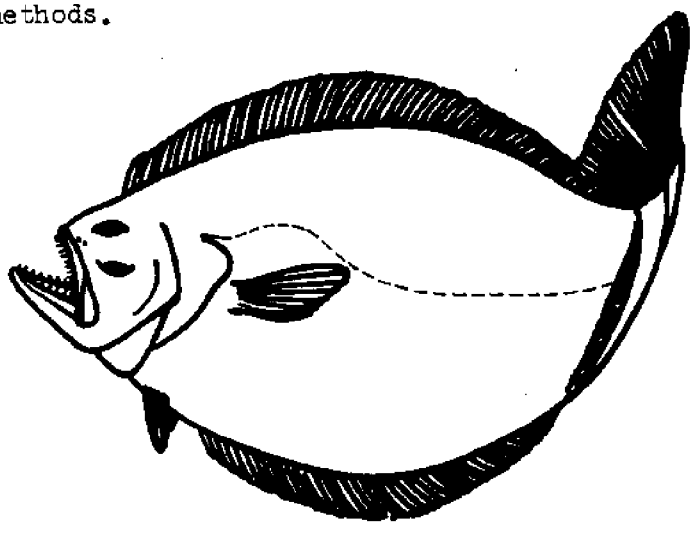
FLOUNDER

Flounder are one of our important year-round food fish. Flounder are caught by sport and commercial fishermen and weigh from $\frac{1}{2}$ to 5 pounds.

Flounder and other members of the flatfish family are born upright with normally placed eyes. But the young soon find their skulls beginning to twist and one eye moving toward the other side. At the same time the fish begins to tilt and within a short time, both eyes are on the same side and the fish swims with its eyeless side down.

Flatfish typically have coloration on only the upper surface of their bodies with the underside being white. The strange characteristic is due to the action of light. In fact, young flounder have been experimentally raised in a special aquarium that was lighted only from beneath with the result that the flounder reversed their coloration, becoming white on top and pigmented underneath.

The flesh of the flounder is firm, white and has a delicate flavor that makes it a year-round favorite. It is particularly popular in restaurants throughout the country and adapts to a wide variety of preparation methods.



MULLET

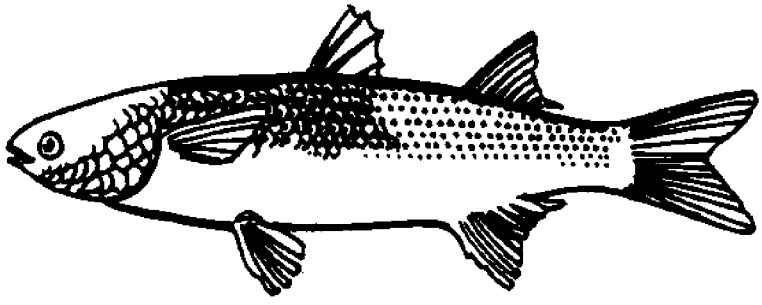
Striped or black mullet are found on both the Atlantic and Pacific coasts of the United States. The largest quantities live in the waters from North Carolina to Texas, primarily along the Gulf coast of Florida.

Florida produces most of the mullet sold in the southeastern states. In recent years, sizeable shipments of mullet and mullet roe (eggs) have been made to foreign nations.

Mullet often swim in large schools. Because many of them will jump simultaneously out of the water, they are relatively easy to locate. Much mullet fishing is done at night and experienced fishermen listen for the sounds of the jumping fish to determine where and when to set their nets.

Mullet are an unusual fish because they have a thick, muscular gizzard very similar to that of a chicken. They are the only fish known in this part of the world to have this peculiar characteristic.

Mullet are inexpensive and best eaten freshly caught. Because of the high oil content in the flesh, mullet makes an excellent choice for smoking or charcoal grilling.

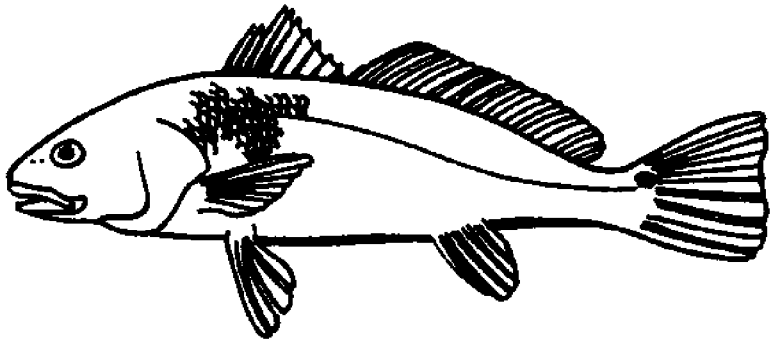


REDFISH

Redfish, a member of the drum family, are also called red drum or channel bass. They can be found along the south Atlantic and Gulf coasts. Redfish are unrelated to red snapper and the two should not be confused.

Small redfish are a silver color with a reddish cast while the larger fish are salmon pink with a darker back. The fish are easily identified by one or more black spots at the base of the tail.

Redfish mature and breed by the end of their first year of life. About 30 inches long at one year, they may grow to a length of five feet and a weight of 75 pounds. The size found in most seafood markets ranges from 2 to 25 pounds. Smaller redfish are usually seen during the summer or early fall, and when filleted may be prepared in the same manner as trout. The fillets of larger fish are also excellent when baked, especially with a creole sauce.



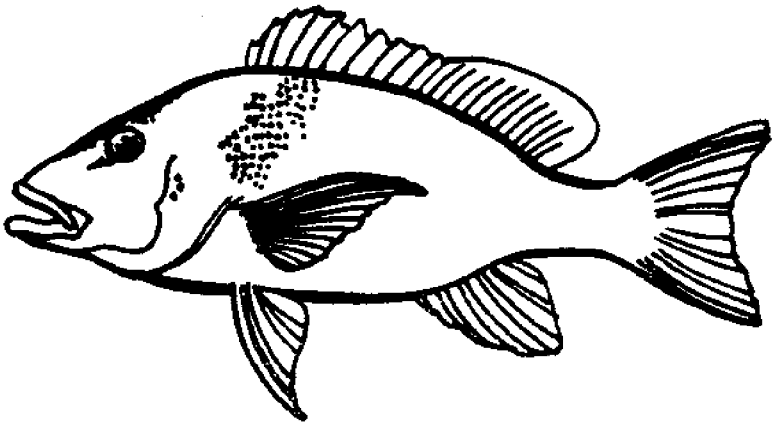
SNAPPER

The snappers are a large and important family of fish that are found in the waters of the Gulf of Mexico. Well-known snappers include the red, pink, mangrove, and yellowtail. Little taste difference exists between these varieties.

Snapper are carnivorous, consuming large quantities of other fish. The family name "snapper" comes from the swift way in which they strike (snap) at their prey.

Most snapper are caught by hook-and-line on banks or reefs in water several hundred feet deep. Snapper are favorites of both sports and commercial fishermen.

Snapper may reach weights up to 30 pounds and are normally available throughout the year. Their firm, white flesh is known for its delicious flavor. Snapper are considered lean fish and are suited for broiling, baking, steaming or poaching.

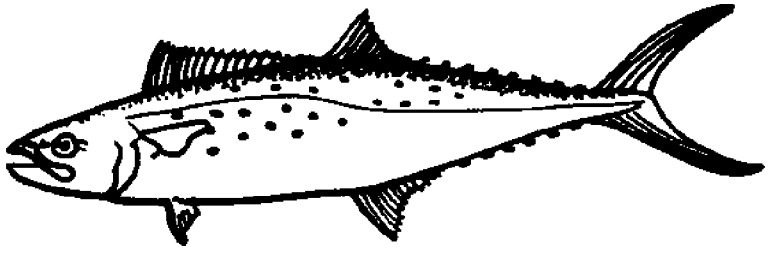


SPANISH MACKEREL

One of the most desirable game and food fish available to Gulf fisherman is the Spanish mackerel. They belong to the same family of fish as the common mackerel of the north, bonita, and tuna. Mackerel reach a weight of about 10 pounds. They can often be seen swimming near the surface of the water.

Because of the migratory habits of this family of fish, Spanish mackerel are found swimming in schools off the Alabama coast for only short periods of time. Their fighting qualities and spectacular leaps out of the water make this fish very popular among sport fishermen.

Spanish mackerel vary in color from a dark blue on the upper part of their bodies to silver on their bellies, with gold spots on their sides. Spanish mackerel do have scales, but they are so small that scaling is unnecessary.



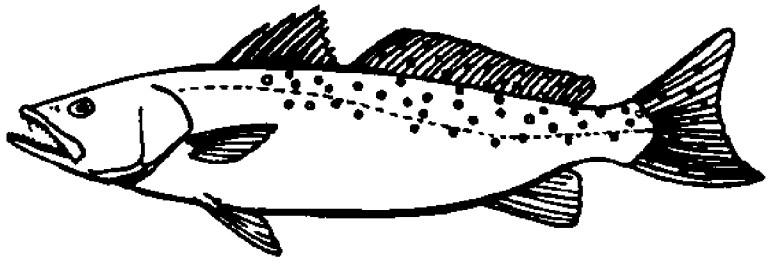
SPECKLED TROUT

The speckled trout, also known as the spotted sea trout, is found along the South Atlantic and Gulf coasts. It is often a surprise to the northern fishermen to discover that the speckled trout caught in Alabama waters are not trout at all, but weakfish. Weakfish are closely related to croakers rather than the trout of northern lakes and streams.

Speckled trout take both natural and artificial bait making them very popular among sport fishermen. Speckled trout may be readily identified by their color. They are a pale silver color on their underside with dark grey on top. They are also marked with many round, black spots.

"Specks" are available throughout the year, but are most abundant during spring, summer and fall. They are quite sensitive to temperature changes and when winter comes, they move into deeper and warmer waters.

Speckled trout have white, tender flesh with a delicate flavor.



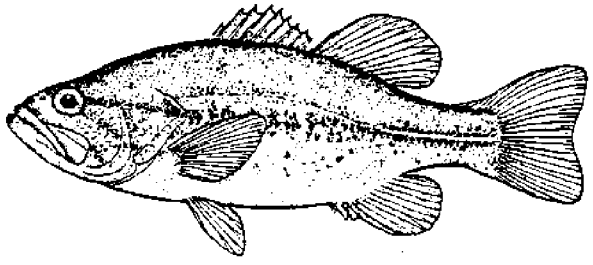
SPECIES IDENTIFICATION - ALABAMA FRESHWATER FINFISH

BASS

Several species of bass are caught in Alabama rivers, reservoirs, creeks and farm ponds. These include the largemouth, smallmouth, white, spotted, striped and red-eye. The largemouth bass, one of the most sought after of the species, is noted for its large size, aggressiveness and ability to fight.

Fish species such as bream and shad are food for the bass. Without the presence of the bass and its huge appetite our waters might be overrun with hungry, super populations of bream and other species.

Bass are the object of amateur and professional sportfishing tournaments in Alabama. Fishermen from throughout the U.S. come to fish lakes such as West Point and Eufaula.

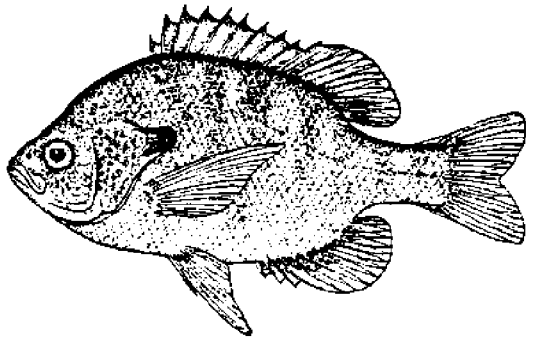


BREAM

The name "bream" is given to members of the sun-fish family which includes bluegills, shell crackers (red-ear), red-breasts and pumpkin-seeds. Bream are probably the most commonly caught fish by Alabama sport fishermen. However, they are rarely found in commercial fish markets.

The majority of Alabama's 40,000 farm ponds are stocked with bream and bass. These ponds provide inexpensive, close to home recreation for thousands of persons while providing food for the table. As fuel becomes more expensive and shorter in supply, bream and bass ponds will receive more fishing pressure.

To produce more bream than found in natural waters, ponds can be fertilized with chemical fertilizers that stimulate the growth of plankton. Plankton are eaten by insects, which are then consumed by the bluegills. By fertilizing, fish production can be increased by two or three times.

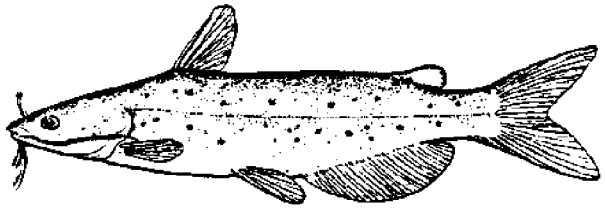


CATFISH

There are four species of catfish sold in Alabama fish markets. They are the channel, blue, white and flathead catfishes. Fishermen commonly capture catfish in baited slat-box traps, gill nets, and trot-lines.

Channel catfish are also raised in farm ponds under carefully managed conditions. Alabama catfish farmers are now second in the nation in production of these fish. Fish hatched in the spring of one year are ready for market as 3/4 to 1 1/4-pound fish in the fall of the following year. Catfish are fed high protein diets to maintain health and promote rapid growth.

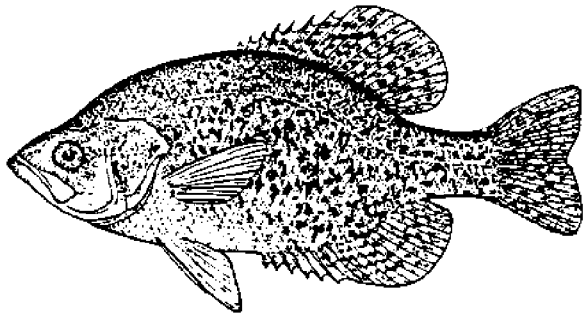
Catfish do not have scales. However, the skin is usually taken off the fish as part of the dressing procedure before cooking.



CRAPPIE

Crappie are a favorite of sport fishermen. They are known for the large numbers that can be caught when a school is located. Crappie survive best in large lakes and reservoirs. In waters of limited area their characteristic boom and bust cycle of reproduction leads to overcrowding and stunted sizes.

Crappie dress easily because their scales come loose with little effort. Larger crappie can be filleted resulting in thin almost circular slabs of meat.

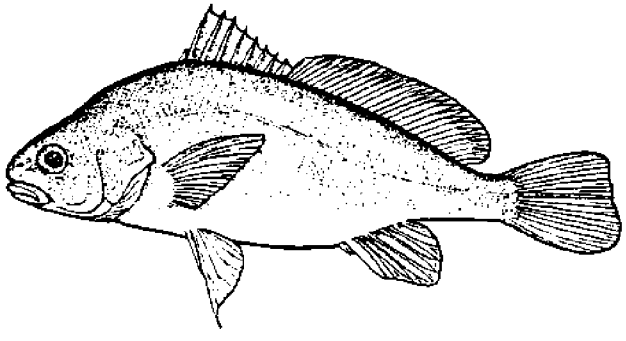


DRUM

Drum are widely distributed throughout the world's fresh-and salt-waters. The freshwater drum from the Alabama and Tombigbee River systems is commonly captured by commercial fishermen and sold at a price that is relatively low compared to prices received for other fish species.

Drum is one of the most underrated food fish sold in Alabama. Common names to describe this species such as "sheepshead" have negatively influenced consumers. However, its limited number of bones, white, flaky meat and light taste make it a fish that should be served more often.

The name "drum" comes from the fish's ability to make a drumming noise using its swimbladder. Drum have generally carnivorous food habits.



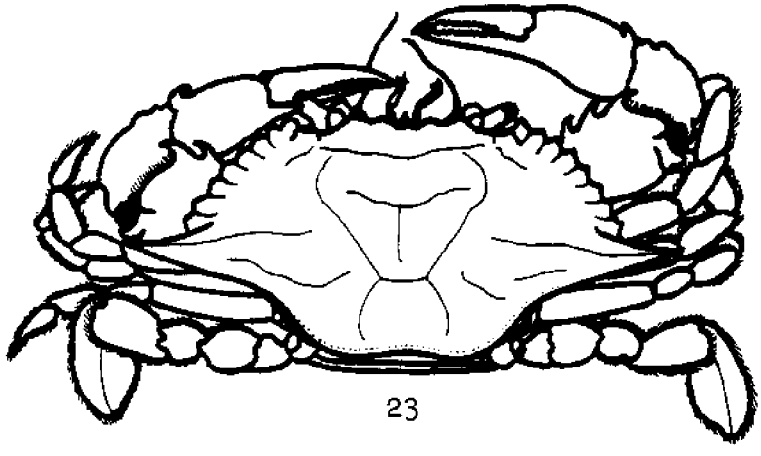
SPECIES IDENTIFICATION - ALABAMA SHELLFISH

BLUE CRAB

Blue crab actually get their name from the color of their claws. When fully grown, blue crab average 5 to 7 inches across the back of their brownish-green or dark green shells. Both the under side of their bodies and their legs are white with a varying amount of blue on the tops of the claws of both males and females. The tips of the claws in the female are bright red.

Blue crab have five pairs of legs with the first pair always equipped with pincers. Like shrimp and lobster, crab carry their skeletons outside their bodies and in order to grow they must shed their hard shell, a process called molting. Before the molt starts, a new soft shell forms inside and the crab backs out of the old shell as it loosens. When caught before the shell has hardened, they are sold as soft-shell crab and are a popular item on restaurant menus.

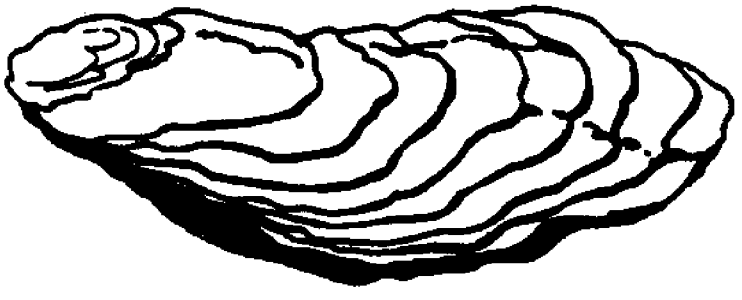
The meat of hard-shell blue crab is also a delicacy and comes in three forms: claw meat from the pincers, white chunks from the body and white flakes from those areas of the crab that are not so easily picked.



OYSTERS

There are three important species of oysters found in U.S. waters, but Eastern or Atlantic oysters which are found along the Gulf Coast make up the majority of the nation's production. They have been a favorite food for centuries and were cultivated in China long before the Christian era. Early North American colonists were delighted to find an abundance of excellent oysters on the coast lines and in the bays near their homes. The native American Indians frequently feasted on oysters and several shell-mounds along Alabama's coasts show us the location of early Indian villages.

In many states, productive oyster waters are leased to individuals who harvest and maintain the reefs in what can be described as oyster farming. However, Alabama's oyster reefs are publicly owned and the oysters may be taken commercially after purchasing an oyster license. Hurricane Frederic severely damaged many of Alabama's oyster reefs in the fall of 1979, but large amounts of time and money are being used to restore these reefs to their pre-hurricane conditions.



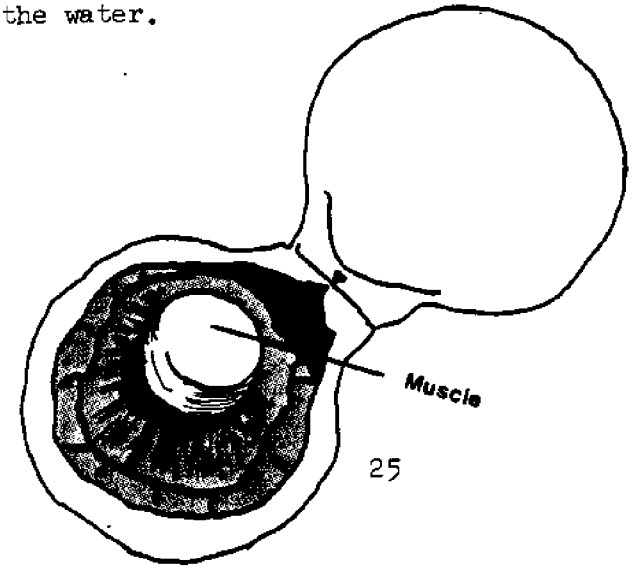
SEA SCALLOPS

The name "scallop" accurately describes the fluted edges of the fan-shaped scallop shell. The shells of young scallops are particularly attractive; the outsides are often delicately colored and the insides are pearl-white with a satin luster.

Scallops have two shells just like clams and oysters. However, they are different from those shellfish in that they are active swimmers. By clapping their shells together, they are able to jet-propel themselves in leaps over the ocean floor. This causes the development of the oversized muscle which is a delicious treat for American consumers. The muscle is the only part of the scallop eaten by Americans while Europeans eat the entire scallop body.

Although most scallop fishing is done in New England waters, the Gulf of Mexico is home for the calico scallop. It is smaller than its northern counterpart and has the mottled marking of calico cloth. Calico scallops are found chiefly in Florida and North Carolina waters.

As soon as they are caught, scallops are shucked aboard the ship that is harvesting them and the meat is bedded in ice. This is because the scallops cannot close their shells tightly and die soon after being taken from the water.



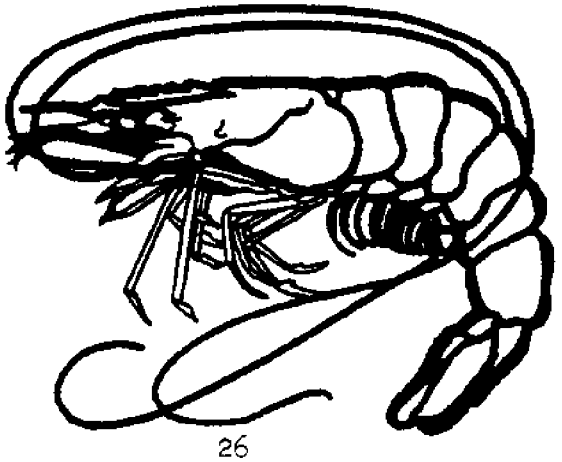
SHRIMP

Shrimp are our nation's number one seafood resource. They produce more income for the commercial fishing industry than any other seafood product.

Shrimp acquired their name because of their relatively small size. The word "shrimp" is derived from the Middle English word "shrimpe", meaning puny person and the Swedish "skrympa", meaning to shrink. Like the other crustaceans, shrimp wear their skeletons on the outside of their bodies and in order to grow, shed their shells and replace them with new ones. Shrimp usually swim forward, but when frightened, they flip their abdomen and propel themselves backward with great speed.

Three main varieties of shrimp are harvested in U.S. waters: the Northern shrimp found in the offshore waters of Maine and Massachusetts; the tiny, North Pacific shrimp along the coastlines of California, Oregon, Washington, and Alaska; and Southern shrimp from the waters of the Gulf and South Atlantic states.

There are three commercially-important species of Southern shrimp: white, brown, and pink. Although they are all members of the same family, their shell color before cooking accounts for the difference in names. After they are cooked, there is little difference in the color of the flesh.

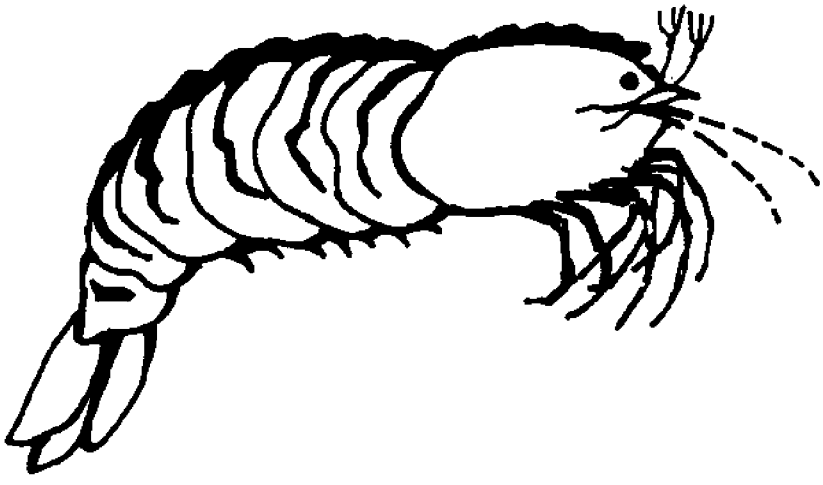


ROCK SHRIMP

Rock shrimp, a member of the shrimp family, could easily be mistaken for a miniature lobster tail. Deriving its name from the extremely tough, rigid exoskeleton, rock shrimp were for centuries the prized catch of fishermen. They were eaten when caught and little known to the public. With increasing demand for shrimp, this seafood delicacy is becoming better known and more highly sought after by consumers along the Gulf Coast.

Rock shrimp can be substituted in recipes calling for shrimp or lobster. The texture of the meat is similar to that of lobster, while the flavor is a cross between that of lobster and shrimp. However, rock shrimp cook much faster than either shrimp or lobster and require close attention to avoid overcooking.

Because the flavor and texture of rock shrimp can be adversely affected by temperature changes and poor handling, the heads are removed and the tails frozen within 24 hours after they are caught. Rock shrimp are marketed frozen as whole tails or with the tails split.



III. BUYING FISH AND SHELLFISH

FISH AND SHELLFISH INSPECTION

We've heard about federal laws which require the U.S. Department of Agriculture to inspect meat, poultry and eggs. Most of us probably assume that the federal government has the same type of laws for seafood products.

The fact is, however, there is presently no compulsory federal inspection program for fishery products. But, there is a voluntary U.S. Department of Commerce inspection program which is being used by more and more seafood processors. Under this program, the processors pay a fee to have a federal inspector work with their own quality-control people to assure a high-quality product. This helps the processor because it identifies and evaluates quality and sanitary standards. It also helps the consumer because it insures a safe, clean and wholesome product.

There are two levels of inspection. The first is plant inspection for sanitation. This is called SIFE - which stands for Sanitarily Inspected Fish Establishment. The second level of inspection is plant and product inspection. This is called the PUFI - which means Packed Under Federal Inspection.

In the SIFE program, Department of Commerce inspectors visit the plant periodically to detect and help correct any problems in hygienic conditions and processing practices. The inspectors make weekly checks to make sure good conditions are maintained.

Processing plants that operate under the PUFI program have a federal inspector on the site during processing. He carefully checks and evaluates the raw product, processing procedures, and the finished product. The company then has the right to put the Packed Under Federal Inspection mark on the packages of products that meet the requirements.

The PUFI mark means that the product has been USDC inspected. It is wholesome and packed under sanitary conditions. The PUFI mark does not mean that the product has been graded as to quality.

Remember that the federal inspection seal applies only to the condition of the product at the time of packing. If you find dented or rusted cans, or heavy frost on frozen product cartons - even if they are USDC inspected - you really can't be sure of the quality of the product.

In addition to these two levels of inspection, another mark is used to indicate the overall quality of the product. That mark is the Grade A shield. The Grade A shield means the very best quality in a seafood product.

Quality is judged by a USDC inspector. He checks the quality of fish flesh, the ratio of fish to breading, odor, color, taste, uniformity of size, absence of holes and blemishes, and processing methods.

The Grade A Shield means that the product was USDC inspected, packed in a sanitary processing plant, and was of top quality at the time of inspection.

If you see a package that doesn't have either the Grade A or the PUFI mark on it, you really don't have any federal assurance of product quality.

Of course, experienced consumers know that many of the fishery products currently sold are of acceptable quality because processors take pride in their products and normally turn out high-quality food items. Using the inspection marks is just one way to take the guess work out of buying fishery products.

FINFISH MARKET FORMS

WHOLE OR ROUND

Whole or round fish are marketed exactly as they come from the water. Before cooking, the fish must be scaled and eviscerated. The head, tail and fins can be removed if desired. The fish may be left whole or cut into fillets, steaks or chunks.

DRAWN

Drawn fish are whole fish that have been eviscerated. Before cooking, remove the scales. The head, tail and fins may be removed if desired. The fish may then be left whole or cut into fillets, steaks or chunks.

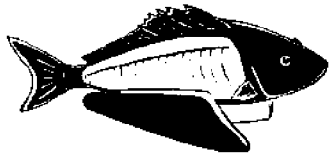
DRESSED

Dressed fish have been scaled and eviscerated. Usually the head, tail and fins are removed. Cook as is or cut into fillets, steaks or chunks. Smaller dressed fish are referred to as "pan-dressed".

STEAKS

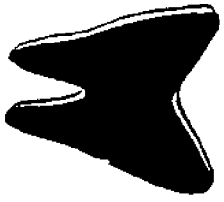
Steaks are cross-sectional slices from large dressed fish, usually about 3/4 of an inch thick. The only bone is a cross-section of the backbone and ribs. Steaks are ready to cook as purchased and are economical since there is little waste.

FILLETS



Fillets are the sides of the fish, cut lengthwise away from the backbone. When properly prepared, fillets are free of bones. They may or may not have the skin left on them.

BUTTERFLY FILLETS



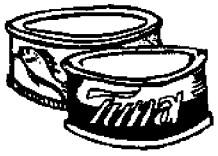
Butterfly fillets are two sides or fillets of fish held together by the uncut belly skin.

CANNED SALMON

Salmon species canned on the Pacific Coast differ in color, texture and flavor. The more expenive forms have a deeper color and contain a greater amount of natural oil. The varieties of canned salmon are:

- Red or Sockeye - deep red-orange color, very firm texture. Attractive in salads and hors d'oeuvres.
- King or Chinook - deep red to beige. Delicious choice for salads.
- Coho - usually labeled "medium red". Suitable for all dishes.
- Pink - pale pink and somewhat soft. Delicious in entrees, soups and sandwiches.
- Chum or Keta - generally bright pink, but ranges from pink to beige, firm texture. Good for casseroles and cooked dishes. (Usually the least expensive variety).

CANNED TUNA



There are two broad classification of tuna: white and light. The light tuna is softer and more fully flavored and less expensive than the white. There are three styles of canned tuna that can be packed in oil or water:

- fancy or solid-usually contains three or four large pieces. Ideal for cold plates.
- chunk - convenient-sized pieces. Especially adaptable for salads.
- flaked or grated - smaller pieces than chunk style. Good in canapes or sandwiches.

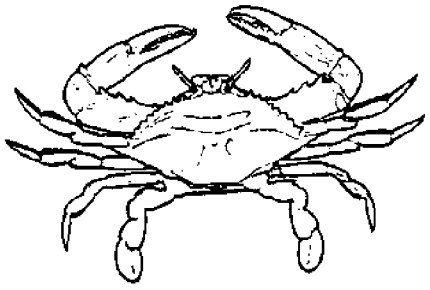
There is also a dietetic pack of tuna. The meat is packed in tuna with no water.

RAW BREADED FISH PORTIONS AND STICKS

Portions are cut from frozen fish blocks, breaded, packaged; then frozen. Ready to cook as purchased, portions and stick contain 60 to 75 percent fish.

SHELLFISH MARKET FORMS

BLUE CRAB



Hard-shell crab may be sold live in the shell or freshly cleaned in the shell.

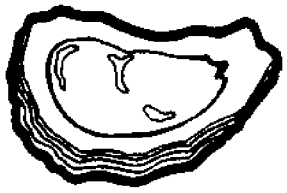
Blue crab may also be steamed, the meat removed from the shell, and sold as fresh crabmeat. This crabmeat is marketed as lump meat - whole lumps from the large body muscles which operate the swimming legs; flake meat - small pieces of white meat from the body; claw meat - a brownish-tinted meat from the claws; or as crab claws (fingers) - a brownish tinted meat left on the claws after the shell is removed, ready to serve cold or fried.

To extend the storage life of fresh crabmeat, pasteurization - a process very similar to canning - may be used. Pasteurization does not change the taste or texture of the meat. However, the pasteurized product does require refrigeration even though it is packed in a sealed can. Since crabmeat is cooked before packaging, it can be used without further preparation.

Blue crabmeat is sometimes frozen or canned. Fresh crabmeat is preferred however, because

in freezing there is some loss of texture and flavor. Canning causes similar changes in the product. Soft-shell crab are available fresh or frozen.

OYSTERS



Oysters are usually purchased either in the shell or shucked. If you've ever tried to open an oyster, you will appreciate the convenience of being able to buy them in the shucked form.

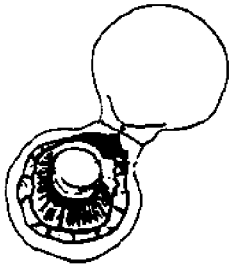
Freshly shucked oysters are plump, have a creamy color and clear liquor. After cleaning and processing, shucked oysters are graded and sold according to size in pint, quart, or gallon containers. The largest shucked oysters are marketed as "selects", while the average size are marketed as "standards". Occasionally a smaller size, "stewing" or a larger size, "count" may be available.

Fresh oysters can be purchased in the shell or out of the shell. When properly refrigerated and handled oysters are safe to eat throughout the year. Oysters do spoil quickly if they are not kept properly cooled. This was probably the basis for the old adage of eating

oysters only in the months with an "r" in their spelling. In years past when refrigeration was not available, this was a good practice, but it is not necessary today. However, oysters are plumpest in winter and early spring.

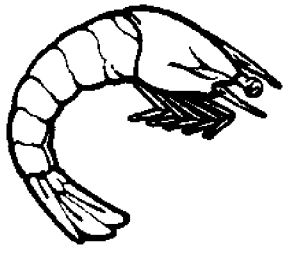
Oysters may be purchased commercially frozen. Freezing oysters, however, has a tendency to break down the protein and make then watery. It is best to use these oysters in stews, chowders and casseroles rather than for frying, since the breading has a tendency to come off.

SCALLOPS



Scallops are unable to close their shells tightly and consequently, die soon after being taken from the water. For this reason the scallop is always shucked immediately after being harvested, and the meat iced. These shucked scallops are then sold either fresh or frozen. The frozen scallops may or may not be breaded.

SHRIMP

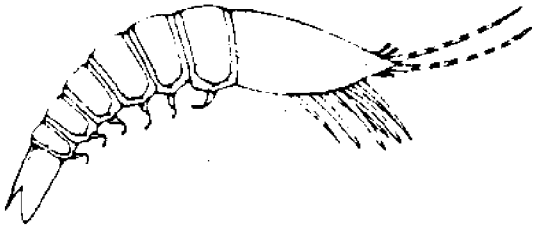


Raw shrimp may be brown, pink or white. But, after cooking, the meat of each is white with reddish tinges. If you see the term "green" shrimp, this does not indicate color, but rather that the shrimp is raw.

Shrimp are available in a variety of market forms - raw or cooked, peeled or unpeeled, with or without heads, and fresh, frozen or canned. The frozen shrimp may or may not be breaded.

Shrimp usually are sold according to size based on the number of headless shrimp per pound. This is indicated by the terms jumbo, large, medium and small. Jumbo indicated 15 or fewer shrimp per pound, and small indicated 60 or more per pound. When deciding how much to buy, remember that two pounds of raw, headless, unpeeled shrimp, properly cooked, will yield one pound of cooked, peeled and deveined shrimp. Also when buying shrimp with the heads, the head is approximately 40% of the body weight.

ROCK SHRIMP



Rock shrimp are very perishable. Therefore, they are usually marketed frozen raw as either whole or split tails.

Rock shrimp are purchased according to size, with the largest size usually available being 21 to 25 pounds.

Properly cleaned and cooked rock shrimp yield about half the weight of the green tails. Therefore, two pounds of green tails will yield one pound of cooked, peeled, deveined rock shrimp.

SELECTION OF FISH AND SHELLFISH

FRESH FISH

-Flesh is firm and elastic and doesn't separate from the bones.

-Fillets and steaks have a fresh cut appearance and color.

-Odor is fresh and mild, characteristically clean and not offensive.

-Eyes are bright, full and often protruding from the head.

-Gills are pinkish red and free from slime.

-Skin is shiny and color has not faded, scales firmly attached.

-Flesh springs back when gently pressed with the finger.

FROZEN FISH

-Flesh is solidly frozen, with no discoloration or freezer burn (white, cottony appearance).

-Odor is not evident or, if slight is not offensive.

-Wrapping is moisture-vapor-resistant. There is little or no air space between the fish and the wrapper.

-Package is free from damage and labeled clearly.

FRESH SHRIMP

-Head is closely attached to tail section.

-Shell and flesh are free of black spots.

-Odor is mild, fresh and clean.

-Flesh is firm.

FRESH OR FROZEN ROCK SHRIMP

-Tails have some transparent or clear white flesh with no discoloration. Shrimp have no objectionable off odor.

COOKED SHRIMP

-Shell and meat have reddish tinge.

-Product is held at correct temperature, according to market form.

FROZEN SHRIMP

-Shrimp solidly frozen.

-No signs of freezer burn.

-Shrimp have little or no odor and no black spots.

OYSTERS IN THE SHELL

-Oysters are alive (Shells should be closed or close tightly when tapped).

-Gaping shells indicate that the oyster is dead and not edible.

SHUCKED OYSTERS

-Flesh is plump and creamy, and liquor is clear.

BLUE CRAB

-Live crab show movement, and are a bright color with no disagreeable odor.

-Freshly cleaned crab have no disagreeable odor and are on ice.

-Frozen soft-shell crab should be solidly frozen in moisture-vapor-resistant wrapping.

SCALLOPS

-Odor is sweet.

-There is no excess liquid when bought in packages.

-Creamy white, light tan or pinkish color of flesh.

CANNED PRODUCTS

-Labels are clear and accurate, and cans are free from damaged areas, rust and bulges.

-Upon examination, can is full and contents are free from extraneous materials.

-Packing medium is fresh and clear.

SEAFOOD BUYING GUIDE

FISH AND SHELLFISH	MARKET FORM	**APPROXIMATE AMOUNT TO PURCHASE FOR 1 SERVING
Fish	Whole or Drawn	1 pound
	Dressed/Pan Dressed	3/4 - 1 pound
	Fillets or Steaks	1/3 pound
	Portions	1/3 - 1/4 pound
	Canned	1/6 pound
Shrimp	Green (headless)	1/3 pound
	Deveined & Cleaned	1/6 pound
Oysters	In Shell	6 whole
	Shucked	1/3 - 1/2 pint
Crab	In Shell	3 to 4 whole
	Picked Meat	1/6 pound
	Stone Crab Claws (Fingers)	3 claws
Lobster	In Shell	1 pound
Clams	In Shell	6 whole
	Shucked	1/2 pint
Scallops	Shucked	1/3 pound

**These figures show the amounts of fish or shellfish needed to supply the necessary protein per serving. But remember that many people will want to eat more. Also, the amount of fish to buy may vary per species depending on the amount of bone in the fish.

IV. HANDLING AND STORING FISH AND SHELLFISH

HANDLING AND STORING FISH

Fish are one of the most susceptible of all flesh foods to spoilage and rancidity. The best way to prevent spoilage is to handle fish properly beginning at the time they are caught.

FRESHLY CAUGHT FISH

Ideally, fish should be cleaned and placed on ice as soon as they are caught to maintain the highest quality. When a fish is caught, remove its viscera and gills, or entire head if desired, and cover the fish with ice. Then when the fishing is slow, finish dressing the fish as desired. But remember, scaling is easier before the fish is eviscerated and chilled.

If fish die slowly, the flesh becomes mushy and begins to deteriorate. When the fish are biting too rapidly to take the time to dress them, keep the fish alive in a collapsible wire fish basket that is large enough to allow them to swim freely when placed in the water. Many fishing boats are equipped with live wells in which fish can live for a time.

At the end of the fishing day, dress any remaining fish and pack them in ice for transporting. Fresh fish will maintain their high quality for two or three days if packed in crushed ice or properly refrigerated.

If you still have a day or two before this time elapses and do not want to freeze the fish, you can keep it covered in ice or in moisture - vapor - resistant wrapping in the coldest part of your refrigerator. A damp cloth placed over the fish before it is wrapped will help prevent drying.

PURCHASED FRESH FISH

Purchased fresh fish can be stored in the original wrapping in the coldest part of the refrigerator, if the wrapping is moisture-vapor-resistant. If it is not, wrap the fish in moisture-vapor-resistant wrapping before storage. Remember that a damp cloth placed over the fish, inside the wrapping, will prevent drying. Purchased fish should be cooked or frozen within two days of purchase.

Commercially packaged frozen fish products should be placed in the freezer immediately after purchase to maintain quality. Store at 0°F. or lower to avoid chemical changes that result in loss of color, flavor, texture and nutritive value. Limit storage time in order to enjoy the best flavor of the fish. Remember the "first in, first out" rule and always use the seafood with the oldest date on the label first.

Thaw purchased frozen fish as you would home frozen fish, but remember never thaw frozen breaded fish. Prepare these according to package instructions.

CANNED FISH PRODUCTS

Store canned fish products in cool, dry places up to one year. Once a can is open, remove the contents and store the product in a covered container in the refrigerator. Use within three to four days.

FREEZING FISH

Freezing is one of the best ways to preserve the quality of fish. The type and condition of the fish, and the methods you use in preparing it for freezer storage determine the final quality.

First, select only high quality fresh dressed fish. Rinse the fish both inside and out with cold water. Dip the fish in $2\frac{1}{2}$ tablespoon salt

to 1 quart of water for 30 seconds to reduce drip upon thawing. Then freeze the fish by any of the following methods:

WRAPPED. Use a moisture-vapor-resistant wrapping such as aluminum foil, polyethylene sheets, or freezer paper. When wrapping the fish, the drugstore wrap is recommended. Cut a piece of moisture-vapor-resistant wrapping large enough to go completely around the fish plus 5 to 6 inches. Place the fish in the center of the paper and bring two opposite sides to the center. Fold the edges over about 1/2 to 3/4 inches. Continue to fold until the wrapping fits snugly around the fish. Turn package over. Fold the sides in to exclude air pockets. Then bring the ends to the center. Tape ends down with freezer tape and label the package according to its contents.

When wrapping fillets put two layers of wax paper or a similar product between each one. This prevents them from freezing together.

FROZEN IN WATER. Place the fish in a shallow pan, cover with water, and freeze. Wrap the ice block in moisture-vapor-resistant wrapping after it is frozen to prevent evaporation of the ice. Fish may also be frozen in clean milk cartons filled with water and sealed at the top.

ICE GLAZED. Place unwrapped fish in the freezer. As soon as the fish is frozen dip it in near freezing ice water. Place fish in the freezer again until the glaze hardens. Repeat the glazing process several times. After a good glaze has formed, wrap the fish in a moisture-vapor-resistant wrapping using the drugstore wrap or put the fish in a plastic bag, removing as much of the air as possible. This method of freezing allows for thawing only the amount of fish needed at one time.

Fish stored at 0°F. have varying storage lives depending upon their fat content. Fish with a moderatly high fat content (5% or more) such as mackerel, mullet, or tuna have a storage life of approximately three months. Lean fish (less than 5% fat content) may be stored up to six months without loss of quality. Remember that most refrigerator freezers maintain a temperature higher than 0°F, so fish will not keep as long in them.

Allow 18 to 24 hours to thaw a one-pound package of fish in the refrigerator. If quicker thawing is necessary, place the package under cold running water, allowing 1 to 2 hours for a one-pound package. Do not thaw fish at room temperature or in warm water, because these temperatures promote the growth of micro-organisms that cause illness.

Frozen fillets or steaks may be cooked without thawing. However, additional cooking time is required.

HANDLING AND STORING SHELLFISH

The proper handling of shellfish is extremely important to its final appearance on your supper table. Shellfish have unique handling and storage procedures which should be followed in order to achieve the best flavor, color and texture.

Bacteria are enemies of shellfish. These microscopic organisms are found practically everywhere and they multiply very rapidly, especially at warm temperatures and high moisture levels. Typically these conditions exist where shellfish are caught.

Shellfish, like most other organisms, have a defense system against these bacteria. Once the shellfish dies, these defenses break down allowing the bacteria to enter. High amounts of bacteria in seafood will lead to off odors, poor texture and poor flavor. Items with these signs should be avoided. There are however several steps you can take to reduce bacterial growth and maintain the quality of each type of shellfish.

SHRIMP

Prior to landing shrimp, the deck of the vessel should be as free of bacteria as possible. To do this, rinse the deck, scrub with a detergent solution (one-half cup bleach to one gallon of water), and then rinse the deck a final time. This procedure will reduce bacteria by 99 percent.

Shrimp should be rinsed of all dirt and slime when landed. If the shrimp are to be packed with the heads on, they should be iced immediately. Shrimp should never be placed in large piles. Thin layers of shrimp followed by thin layers of ice is best. This will

provide a low temperature, reduce the pressure on the lower layers of shrimp and allow for the melting ice to wash the shrimp.

Most of the bacteria of live shrimp are contained in the digestive tract and on the shell. The quick removal of these parts after the shrimp is brought aboard the boat will reduce the rate at which the bacteria invade other tissues.

Shrimp will also keep better if they are headed immediately after being brought aboard. It is important that all of the organs in the head region are removed.

Freshly caught shrimp will keep for two to three days packed in crushed ice in an insulated container or refrigerator. Purchased shrimp will also keep for one to two days if stored in the same manner. Shrimp should be frozen if they cannot be cooked within these time periods. Cooked shrimp can be stored in the refrigerator for two to three days.

When freezing shrimp, remember that raw, headless shrimp maintain quality during freezing longer than frozen, cooked shrimp. Fresh shrimp can be frozen in water or ice glazed (see page 48). Cooked shrimp should be packed in moisture-vapor-resistant wrapping. Frozen raw shrimp maintain quality for about six months at 0°F. While frozen cooked shrimp should be used within three months.

Thaw frozen shrimp in the refrigerator, allowing 18 to 24 hours for a one-pound package to thaw. For quicker thawing, place them under cold running water. Never thaw shrimp at room temperature and never refreeze them.

CRAB

Crab must be kept alive until they are cooked. Because the crab's internal organs are close to the meat, dead crab are quickly invaded by

bacteria. Crab can be kept alive for several hours after being caught by keeping them in a cool, damp, well-ventilated container. Crab will die quickly when placed in containers of water unless the water is aerated.

After cooking, the crab can be packed in ice and refrigerated either in the picked or unpicked form, for two to three days. Fresh picked crabmeat which you purchase at your supermarket or seafood store should also be packed in ice and used within one to two days. Pasteurized crabmeat can be stored, unopened for up to six months. Once opened, it should be packed in ice and used within one to two days.

Fresh raw crabmeat can be frozen for one to two months. Remove the claws and the pod of cartilage containing the meat. Discard the rest of the crab. Freeze the uncracked claws and unpicked pod of meat whole in water (see page 48). Crabmeat should be thawed like fish and shrimp.

OYSTERS

After harvest, oysters should be kept cool and moist, away from fresh water. Unshucked (live) oysters will keep for seven to 10 days if they are kept on ice in a refrigerator or insulated container between 35°F to 40°F. Dead oysters (those whose shells are open and do not snap closed when disturbed) should be discarded.

Fresh, shucked oyster meat can be placed in a container and packed in ice in a refrigerator or insulated container for up to one week. The same is true for purchased shucked oysters. Oysters lose quality during freezing and when thawed are best used in casseroles, soups and chowders. If freezing is necessary, freese

purchased freshly shucked oysters in the can they come in. Pack freshly shucked oysters in their own liquor in a container, leaving at least two inches of air space at the top. Use home frozen oysters within three to four months. Oysters should be thawed like fish and shrimp and cooked immediately. Never refreeze oysters.

SCALLOPS

Fresh scallops should be packed in ice and stored in the refrigerator. They should be used within two days. Allow 24 hours for frozen scallops to thaw in the refrigerator.

COOKED SHELLFISH

Store cooked seafood in the refrigerator or freezer. When refrigerated, place it in a covered container and use within three to four days.

FROZEN FISH AND SHELLFISH STORAGE LIFE
(at 0 degrees F)

Good quality products that are handled properly from catch to freezer should retain their quality for the period indicated below.

TYPE		MONTHS
Fat	Mackerels, trout tuna, salmon, mullet	3
Lean	Flounder, cod, whiting, redfish, croaker, snapper, grouper, sheepshead	6
Shellfish	Lobster and crab meat	2
	Shrimp	6
	Oysters, scallops, clams (shucked)	3 to 4

V. PREPARING AND COOKING FISH AND SHELLFISH

FISH COOKERY

Fish cookery is fun! By using different kinds of fish, various cooking methods, complementary sauces, colorful garnishes and imagination, you can create dishes high in nutrition and good taste.

Cooking fish correctly is as important as good selection and storage. Proper cooking develops the fine flavor and softens the small amount of connective tissue.

Here are some pointers to insure success when cooking seafood:

Know your product. For best results in preparing fish, know if the product is fat or lean. Both can be cooked by a basic cooking method, but lean fish require more added oil during cooking to keep them moist and flavorful.

Handle fish carefully. Because fish flesh is tender and delicate, handle it as little and as gently as possible during and after cooking to preserve its appearance. Fish to be breaded or stuffed is easier to handle if the fish is thawed first. Frozen fillets and steaks may be cooked without thawing if additional cooking time is allowed. Breaded frozen fish items should not be thawed before cooking. To help retain a pleasing shape, carefully transfer poached fish from its simmering liquid to the serving platter.

Don't overcook fish. Cooking fish at too high a temperature or for too long a time will toughen and dry the flesh and destroy the fine flavor. Fish are done when the flesh loses its translucent appearance and becomes opaque. To check for doneness, pierce the thickest part of the flesh with a fork. It will flake easily at the peak of cooked quality.

Keeping these hints in mind, cook fish by any of the following preparation methods which will be the framework for hundreds of variations.

FAT AND LEAN FISH

Though fish in general are considered a low-fat source of protein, there are differences in fat content from one specie to another. These differences affect the flavor and texture of the fish and dictate the best cooking method.

In a fish of moderately high fat content (5 percent or more) such as mackerel, mullet or tuna, oil is distributed throughout the flesh of the fish, causing it to have a more pronounced and distinctive flavor, a more meatlike texture and a darker color than a lean fish (less than 5 percent fat content). The leaner fish, on the other hand, tends to concentrate its oils in the liver, which is removed when the fish is cleaned. The lean fish is much milder in flavor and whiter in color than the fatty fish.

The difference in the amount of oil a fish retains in its flesh affects your choice of cooking method. Fatty fish are more likely to remain moist when subjected to searing heat, so are adapted to such methods as broiling, barbecuing and baking at high temperatures. Smoking is an excellent method to use with fat fish.

Leaner fish may dry out too much when cooked by these methods unless basted frequently with margarine or oil. And the usually mild flavor may be overpowered by barbecuing because of the strong smoky taste. The lean fish poaches beautifully, because its flesh firms as it gently cooks in a simmering liquid. The following list will help you determine which cooking methods are suitable for each fish.

SPECIES OF FISH	FAT OR LEAN	BROIL	BAKE	BOIL STEAM POACH	FRY SAUTE
Alewife	Fat	. . .	Best	Good	. . .
Barracuda	Fat	Good	Best	. . .	Fair
Black Bass	Lean	Good	Good	. . .	Good
Bloaters	Fat	. . .	. . .	. . .	Best
Bluefish	Fat	Good	Best	. . .	Fair
Bonito	Fat	Good	Best	. . .	Fair
Bream	Lean	. . .	Good	. . .	Best
Buffalo Fish	Lean	Good	Best	. . .	Fair
Bullheads	Lean	. . .	Fair	Good	Best
Butterfish	Fat	Good	Fair	. . .	Best
Carp	Lean	Good	Best	. . .	Fair
Catfish	Lean	. . .	. . .	Good	Best
Cod	Lean	Best	Good	Fair	. . .
Crappie	Lean	Good	Good	. . .	Best
Croaker	Lean	Good	Fair	. . .	Best
Drum	Lean	. . .	Best	Good	. . .
Eels	Fat	. . .	Good	Fair	Best
Flounder	Lean	Good	Fair	. . .	Best
Fluke	Lean	Good	Fair	. . .	Best
Grouper	Lean	. . .	Best	. . .	. . .
Grunt	Lean	Good	. . .	. . .	Best
Haddock	Lean	Best	Good	Fair	. . .
Hake	Lean	Fair	Best	Good	. . .
Halibut	Fat	Best	Good	Fair	. . .
Herring, Lake	Lean	Good	Fair	. . .	Best
Herring, Sea	Fat	Best	Fair	. . .	Good
Jewfish	Lean	. . .	Best	. . .	. . .
Kingfish	Lean	Best	Good	Fair	. . .
King Mackerel	Fat	Best	Good	. . .	. . .
Lake Trout	Fat	Fair	Best	. . .	Good
Ling Cod	Lean	Best	Good	Fair	. . .
Mackerel	Fat	Best	Good	Fair	. . .
Mango Snapper	Lean	Good	. . .	. . .	Best
Mullet	Fat	Good	. . .	. . .	Fair
Muscallounge	Lean	Best	Good	. . .	Fair
Perch	Lean	Good	Fair	. . .	Best

SPECIES OF FISH	FAT OR LEAN	BROIL	BAKE	BOIL STEAM POACH	FRY SAUTE
Pike	Lean	Fair	Good	. . .	Best
Pollock	Lean	Fair	Good	Best	. . .
Pompano	Fat	Best	Good	. . .	Fair
Porgies (Scup)	Fat	Good	Fair	. . .	Best
Redfish	Lean	Good	Best	. . .	. . .
Red Snapper	Lean	Good	Best	Good	. . .
Robalo (Snook)	Lean	Good	Best	. . .	. . .
Rockfish	Lean	. . .	Good	Best	. . .
Rosefish	Lean	. . .	Good	. . .	Best
Salmon	Fat	Good	Best	Fair	. . .
Sablefish	Fat	. . .	. . .	Good	. . .
Sardines	Fat	. . .	Best	. . .	. . .
Sea Bass	Fat	Best	Fair	. . .	Good
Sea Trout	Fat	Best	Good	. . .	Fair
Shad	Fat	Good	Best	. . .	Fair
Shark	Fat	. . .	Best	Good	. . .
Sheepshead (Fresh)	Lean	. . .	Good	Best	. . .
Sheepshead (Salt)	Lean	Best	Good	. . .	Fair
Smelts	Lean	Good	Fair	. . .	Best
Snappers	Lean	Good	Best	Fair	. . .
Sole	Lean	Good	Fair	. . .	Best
Spanish Mackerel	Fat	Best	Good	. . .	Fair
Spot	Lean	. . .	. . .	. . .	. . .
Striped Bass	Fat	. . .	Good	Best	. . .
Sturgeon	Fat	Good	Best	Fair	. . .
Suckers	Lean	Good	Fair	. . .	Best
Swordfish	Fat	Best	Good	Fair	. . .
Tautog (Blackfish)	Lean	Best	Good	. . .	Fair
Trout	Lean	Good	Fair	. . .	Best
Tuna	Fat	Fair	Best	Good	. . .
Walleye (Pike Perch)	Lean	. . .	. . .	Best	. . .
Weakfish (Sea Trout)	Lean	Best	Good	. . .	Fair
Whiting	Lean	. . .	. . .	Best	. . .
Whitefish	Fat	Good	Best	. . .	Fair
Yellowtail	Fat	. . .	Good	Best	. . .

NOTE: All Shellfish are Lean. Fat = more than 5% fat. Lean = less than 5% fat.

BASIC METHODS OF FISH COOKERY

BAKING

To cook by dry heat, place the fish in a greased baking dish. Keep the fish moist and flavorful with seasoned melted fat. sauce or any condiment of your choice. Fillets and steaks adapt easily to many recipes that require baking. A whole fish may be stuffed with an herb and bread stuffing and baked with the head and tail still attached. Bake fish at 350°F until the fish flakes easily when tested with a fork. Cooking time varies according to thickness of fish, but approximately 10 minutes per inch is a general rule for thawed fish.

BROILING

With a dry heat method of cookery, the heat is direct, intense and comes only from one source. Choose pan-dressed fish, fillets or steaks. Place the fish in a single layer on a well-greased baking pan. Baste the fish well with melted fat or a basting sauce before and during cooking. The surface of the fish should be 3 to 4 inches from the source of heat. Cooking time is usually 8 to 10 minutes. Turn thicker pieces, such as pan-dressed fish, halfway through the cooking time and baste.

CHARCOAL BROILING

For cooking fish over hot coals, choose pan-dressed fish, fillets or steaks. Thick cuts are preferable. A well-greased, long-handled hinged wire grill is recommended for ease in turning. Baste fish with sauce before and during broiling. Broil about 4 inches from moderately hot coals for 10 to 20 minutes, depending on the thickness of the fish. Fish is done when it flakes easily when tested with fork.

SIMMERING

Although shrimp and other seafood is generally referred to as "boiled", it should not be boiled. Shellfish and fish are simmered when they are to be served with a sauce or flaked and combined with other ingredients. In a large boiler pot bring salt and water (1 tablespoon to 1 quart) to a rolling boil. Add seafood, reduce heat and simmer shrimp for 2 to 3 minutes, lobster and crab 12 to 15 minutes and fish 5 to 7 minutes.

POACHING

Poaching is cooking food in a simmering liquid. Place the fish in a single layer in a wide, shallow pan, such as a fry pan, and barely cover with a liquid. The liquid for poaching fish may be lightly salted water, water seasoned with herbs and spices, milk or a mixture of white wine and water. Simmer the fish just 5 to 7 minutes until it flakes easily when tested with a fork. Poached fish can be served as an entree either plain or with a sauce, used as a main ingredient of a casserole, or chilled and flaked for a salad or dip.

STEAMING

Steaming is a delicate way to cook fish. Use a deep pan with a tight cover. If a steam cooker is not available, anything that prevents the fish from touching the water will serve as a steaming rack. The water may be plain, or seasoned with various spices. Bring the water to a rapid boil, place the fish on the rack, cover the pan tightly, and steam for about 5 to 8 minutes or until the fish flakes easily when tested with a fork. Serve steamed fish the same as poached fish.

DEEP-FAT FRYING

A popular cookery method involves cooking fish in a deep layer of hot oil. Allow room for fish and bubbling oil. Do not fill the fryer more than half full of oil. Place breaded or batter dipped fish, one layer at a time, in the fry basket, so that the pieces do not touch. This allows thorough cooking and even browning. Lower the basket slowly into the oil heated to 360°F. Fry fish until they are lightly browned and flake easily when tested with a fork. Before frying additional fish, be sure the oil returns to 360°F.

PAN-FRYING

This method involves cooking in a small amount of hot oil. Heat about 1/8 inch oil in the bottom of a heavy fry pan. Place breaded fish in a single layer in the hot oil. Do not overload the pan. Fry fish at a moderate temperature until lightly browned on one side, then turn and lightly brown the other side. Allow 8 to 10 minutes cooking time.

OVEN-FRYING

Oven-frying is similar to pan-frying. Dip fish in salted milk and coat with a breading mixture of your choice. Place fish in a shallow, well-greased baking pan. Drizzle melted fat or oil over the fish and bake in an extremely hot oven, 500°F, until fish flakes easily when tested with a fork. Fish cooked by this method does not require turning or basting and the cooking time is short. This method is especially good for serving large groups.

SMOKING

Use a covered charcoal, electric or gas grill. The smoky flavor is obtained by adding water-soaked wood chips to briquettes. Fish is placed on the grill, skin side down, and basted frequently during cook-

ing. Cooking time varies with weather, intensity of heat, amount of moisture in chips, type of grill and distance of fish from heat.

PLANKING

Another way to bake whole fish, steaks or fillets is planking. Oil the plank or board carefully and heat slowly in the oven. Arrange the fish on the warmed plank, brush with oil and bake at 350°F, until fish flakes easily. Remove from the oven, arrange hot mashed potatoes and vegetables around the fish and serve on the plank.

MICROWAVE COOKING

Fish adapts well to microwave cooking since, unlike other meat products, a brown color is not required for the product to be aesthetically pleasing. Fish should be cooked at a high setting which radiates the most power and cooks food quickly to retain natural goodness, flavor and texture. Follow the manufacturer's directions for best results.

SHELLFISH COOKERY

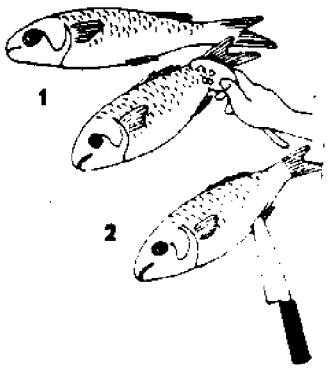
Shellfish can be cooked by many of the same methods as finfish. Check specific recipes for directions. But remember - it's very important not to overcook shellfish. Over-cooking toughens shellfish.

When using a microwave to cook shrimp, it's best to cook the shrimp on a high setting. Shrimp cooked with the shell on in a microwave will be more moist and tender than those peeled and deveined before cooking.

PREPARING FISH

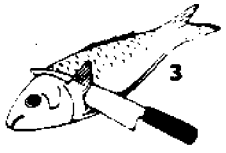
To dress a whole or round fish, lay the fish on a board and grasp the head firmly.

1. Using a scaler, stiff knife, or a large tablespoon, scrape the scales off, working from the tail to the head. (Scaleless fish such as the Spanish Mackeral or small-scaled fish do not have to be scaled.)

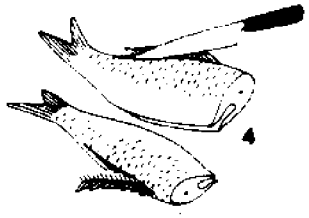


2. Make a cut the entire length of the belly and remove the entrails and the pelvic fins.

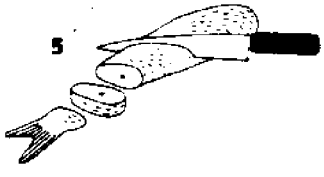
3. Using a sharp knife, remove the head and the pectoral fins by making a cut just in back of the head (in front of the collarbone). If the backbone is large, cut down it on either side and snap the head off.



4. Remove the dorsal fin by cutting along each side with a sharp knife and grasp the end near the tail with one hand and give a quick pull toward the head. Clean and rinse the fish thoroughly. The fish is now dressed, or pan-dressed and ready to be cooked.

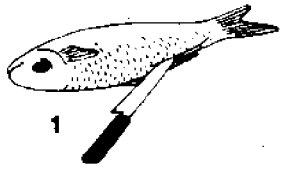


5. With one additional step a large dressed fish can be steaked by cutting across the backbone with a sharp knife at approximately 1 to $1\frac{1}{4}$ inch intervals.



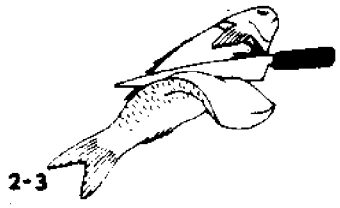
To fillet a fish it is not necessary to completely dress the fish. Scale the fish, unless fillet is to be skinned.

1. With a sharp knife, cut through the flesh along the backbone from the tail to just behind the head.



2. Cut down to the backbone just behind the collarbone.

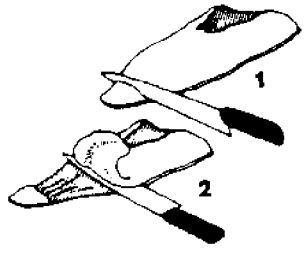
3. Turn the knife flat and slide along the rib bones to the tail, cutting the flesh away from the backbone. Turn fish over and repeat the operation.



If skinning a fillet is desired, it is easier to do when fillet is unscaled.

1. Lay the fillet, skin side down, on a cutting board. Hold the tail end of the fillet with the fingers of one hand. With a sharp knife at an angle, make a cut about ½ inch from the tail end through the flesh to the skin, being careful not to cut through the skin.

2. Lay the knife blade flat against the skin and push the knife forward along the skin while holding the free end of the skin firmly with the fingers.



PREPARING LIVE BLUE CRAB

To prepare live crab whole, first place them in boiling seasoned water, cover, and return to the boiling point. Reduce the heat and simmer for 12 to 15 minutes. Drain. Rinse in cold water and eat, using the same steps as listed below for cleaning a crab.

Crab may also be cleaned prior to cooking and only the claws and inner skeleton (or pod) which contains the white meat cooked. However, the cooking time should only be five to seven minutes.

TO CLEAN BLUE CRAB

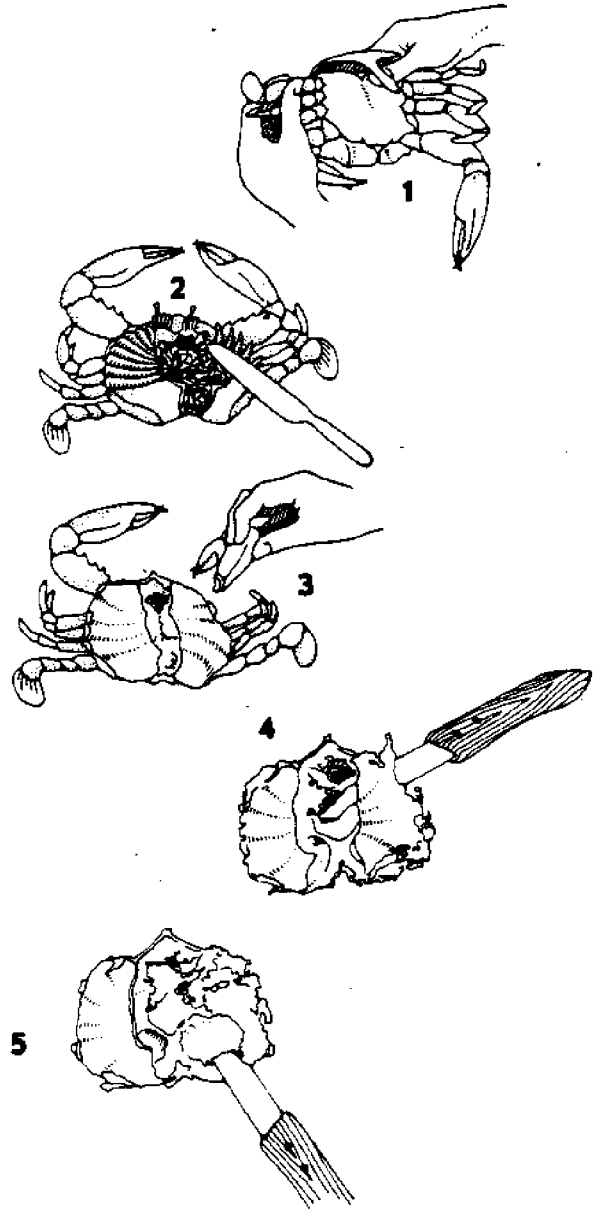
1. With crab upside down, grasp the legs on one side firmly with one hand, and with the other hand lift the flap (apron) and pull back and down to remove the top shell.

2. Turn the crab right side up, remove the gills and wash out the intestines and spongy material.

3. With a twisting motion pull the legs loose from the body. Remove any meat which adheres to the legs. Break off claws.

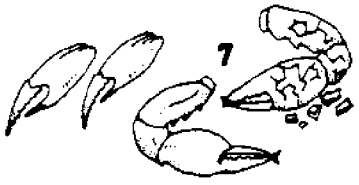
4. Slice off the top of the inner skeleton and remove all exposed meat on this slice.

5. At the back of the crab, on each side, lies a large lump of meat. With a very careful U-shaped motion of the knife, remove this back fin lump.



6. Remove the white flake meat from the other pockets with the point of the knife.

7. Crack the claw shell and remove the shell along with the moveable pincer. This will expose the claw meat and if left attached to the remaining pincer, it will make a delicious (crab finger) hors d'oeuvre. Or the dark meat can be removed and used in soups, casseroles or salads.

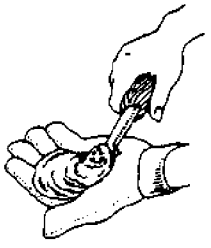


PREPARING LIVE OYSTERS

To shuck whole oysters, cotton gloves and an oyster knife are recommended. An oyster knife has a heavy wedge-shaped blade and handle made in one piece. It is designed to withstand the pressure required to open oysters. Never use a sharp knife.

Rinse the oyster thoroughly. The cleanest way to open oysters is to grasp the oyster securely by the thin end or "bill" leaving the hinge (thicker portion) exposed toward the other hand. Usually there is a small crevice at the hinge.

1. Insert the oyster knife in this crevice between the shells; twist the knife while pushing it firmly into the opening to sever the hinge.



2. Once the hinge is broken, before pulling the shell apart, slide the knife along the inside of the top shell and cut the adductor muscle loose from the shell.

3. Remove the top shell and again slip the knife under the oyster, being careful not to mutilate the oyster, and cut the muscle away from the bottom shell. Remove any remaining shell particles which may be attached to the oyster. Most oysters, except the very largest, can be opened by this method.

For larger oysters, another method is to break part of the shell on the thin end with a hammer to make an opening. Insert the knife in the opening and slide it along the inside of the top shell to cut the adductor muscle and then cut the oyster away from the remaining shell. This method tends to leave more shell particles on the oyster. Be careful not to mutilate the oyster.

Oysters are easy to prepare, entirely edible, are delicious raw or cooked in a variety of recipes. They can be baked, broiled, stewed, fried, or cooked in casseroles. To retain the delicate, distinctive flavor of oysters, cook only long enough to heat thoroughly and maintain their natural plumpness and tender quality.

PREPARING SHRIMP

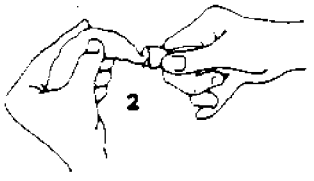
CLEANING SHRIMP

Shrimp can be cleaned either before or after cooking, but it is simpler to do when the shrimp is raw. The head is the first part that is removed. Simply pull off the head and discard. Most people remove the heads soon after purchase because they spoil more quickly than the rest of the body, but it is possible to cook fresh shrimp with the heads on and then remove them.

After the head is removed the final cleaning involves removing the shell, tail and sand vein (if desired).

1. To peel, hold the tail of the shrimp in one hand; slip thumb of other hand under shell between swimmerettes and lift off several segments of shell. Repeat, if necessary, removing all but the tail section.

2. If tail section is to be removed, hold the tail section and squeeze with the thumb and forefinger. Pull the shrimp meat with the other hand until it is released from the shell.



3. The vein (usually black) located along the upper curve is commonly referred to as the "sand vein". To remove the "sand vein", make a cut with a sharp knife about 1/8 inch deep along the upper curve of the shrimp; then rinse away the sand vein under cold running water.

The "sand vein" does not have to be removed, but most people prefer to remove it to prevent any sand or "grit" in the cooked shrimp. It can be removed before or after cooking, but is much easier to remove

before cooking. The vein which is located on the under curve is part of the circulatory system and need not be removed.

There are several varieties of shrimp peeling and deveining tools available on the market. Some work better than others, but all are designed, when used properly, to remove the shell and vein from the shrimp in one easy motion. All work best when shrimp are peeled and deveined in the raw state.

BOILING SHRIMP

Shrimp may be boiled before or after cleaning depending on personal preference. From experience it has been observed that people eat more boiled shrimp when the shrimp is served peeled and deveined. They do not eat quite as many if they have to work at it.

Although raw shrimp are easier to clean, cooking shrimp with the shell on gives the cooked shrimp a richer pink color and a more natural curve. Cooking time varies only slightly between peeled and unpeeled shrimp; however, cleaned shrimp require a little closer attention to avoid overcooking. The amount of salt is the largest variation, in that shrimp simmered in the shell require $\frac{1}{4}$ cup salt while peeled and deveined shrimp require only 2 tablespoons.

BOILED SHRIMP

2 pounds raw, headless, peeled shrimp, fresh or frozen	OR	2 pounds raw, headless, unpeeled shrimp, fresh or frozen
5 cups water		5 cups water
2 tablespoons salt		$\frac{1}{4}$ cup salt

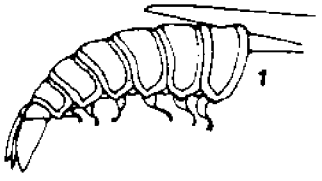
Thaw shrimp if frozen. Rinse shrimp thoroughly and drain. Add salt to water and bring to a boil. Add shrimp and reduce heat. Cover and simmer 3 to 4 minutes or until the largest shrimp is opaque in the center when tested by cutting in half. (Cooking time will vary according to size of shrimp. Jumbo shrimp will require a little longer cooking time.) Drain shrimp. Rinse shrimp thoroughly for 1 to 2 minutes under cold running water. Serve warm or cold.

PREPARING ROCK SHRIMP

When available, split tails are the easiest to prepare. Cleaning the whole tail is not difficult, but hands combat the hard shell better if armored with rubber gloves. Thaw the rock shrimp under cold running water as they are being cleaned and be ready to cook them immediately.

To clean, hold the tail section in one hand with the swimmerettes down toward the palm of the hand.

1. Using kitchen shears insert one blade of the scissors in the sand vein opening and cut through the shell along the outer curve to the end of the tail.



2. Pull the sides of the shell apart and remove meat. Wash thoroughly in cold water to remove all the sand vein. The rock shrimp are then ready for simmering.

SIMMERING ROCK SHRIMP

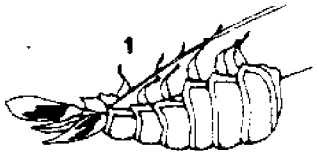
Rock shrimp cook faster than other shrimp and require very close attention to avoid overcooking. When overcooked, the meat becomes rubbery and the exquisite texture is destroyed. To simmer approximately 1½ pounds raw, peeled, deveined rock shrimp, add 2 tablespoons salt to 1 quart water and bring to a boil. Place rock shrimp in boiling water and simmer for 30 to 45 seconds. Drain. Rinse in cold water for one to two minutes. Remove any remaining particles of sand vein. Serve with melted butter, with a sauce, or use in recipes calling for cooked shrimp. Cooked rock shrimp are also good to use in recipes calling for lobster.

BROILING ROCK SHRIMP

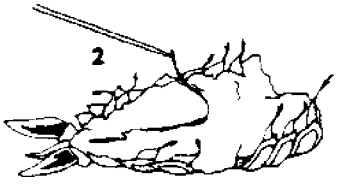
Rock shrimp are delicious broiled in the shell. However, the cleaning instructions are different for this method of cooking.

To clean the whole rock shrimp tails for broiling:

1. Place a rock shrimp tail on a cutting board with the swimmerettes exposed. With a sharp knife make a cut between the swimmerettes through the meat to the hard shell.



2. Spread the shell until it lies flat; wash thoroughly in cold water to remove all the sand vein. Commercially split tails are in this form. The meat can be removed from the shell and cooked by the simmer method (reducing the cooking time to 25 to 30 seconds) or broiled.



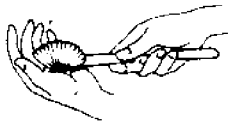
To broil, lay rock shrimp flat on a baking pan with meat exposed. Brush with melted butter or margarine. Sprinkle with garlic salt and paprika. Broil four inches from source of heat for approximately two minutes or until tails turn upward. Serve immediately.

PREPARING SCALLOPS

SHUCKING SCALLOPS

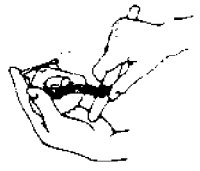
To shuck a scallop, hold it in the palm of one hand with the shell's hinge against the palm.

1. Insert a slender, strong knife, not sharp (a dinner knife will do) between the halves of the shell near the hinge, then twist to give access to the inside. Do not force the shell open as this will tear the scallop muscle.

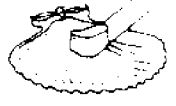


2. Lift the top side of the shell far enough to insert the knife point and sever the muscle from the top shell. Remove the top shell. Leave the muscle attached to the bottom shell until all viscera is removed.

3. To remove the viscera, grip the dark portion of the scallop firmly between the thumb and knife blade and pull gently. This should remove everything but the edible white scallop muscle.



4. When all viscera is removed, sever the muscle from the remaining shell. Wash the scallop meat in cold water, place in moisture-vapor proof wrapping and ice immediately.



POACHING SCALLOPS

Poach scallops just long enough to heat thoroughly. Test for doneness by cutting a large scallop in half and when the center is opaque and white, scallops are done. Overcooking causes toughness and valuable weight loss.

BASIC POACHED SCALLOPS

1½ pounds calico or bay scallops, fresh or frozen
2 cups water
3 tablespoons lemon juice
½ teaspoon salt
3 slices onion
Clarified butter

Thaw scallops if frozen. Rinse scallops with cold water to remove any remaining shell particles. Drain. Combine water, lemon juice, salt and onion in a 10-inch frypan and bring to a boil. Add scallops; reduce heat and cover. Cook 2 to 3 minutes, depending on size. Drain scallops. Serve with clarified butter or use in recipes requiring cooked scallops. Yields approximately 1 pound cooked scallops, the minimum required to serve six.

VI. SERVING FISH AND SHELLFISH

SERVING FISH AND SHELLFISH

SEASONING FISH AND SHELLFISH

Use a light hand with seasonings to enhance the delicate flavors of fish and shellfish and not overpower them. The range of tastes and aromas which seasonings provide is boundless. These herbs and spices can add that extra something to make your recipes more special.

Basil	Fines Herbes	Paprika
Bay leaf	Garlic powder	Parsley
Cayenne Pepper	Garlic salt	Rosemary
Celery Salt	Marjoram	Saffron
Celery Seed	Mustard	Tarragon
Curry Powder	Nutmeg	Thyme
Dill Weed	Onion salt	

FISH PLATTER ACCOMPANIMENTS

Choose a contrasting flavor to accompany fish or shellfish entrees. A tangy-sweet flavor enhances their delicate tastes. Build "appetite appeal" as well as "eye appeal" into your fish and shellfish meals by trying one of these in addition to a vegetable dish to round out the meal.

* Broiled pineapple chunks wrapped in 1/3 slice bacon, skewered with a wooden pick.
* Miniature kabob of cheese, fruit and olives.
* Anchovy-butter stuffed celery.
* Broiled tomato slices sprinkled with Parmesan cheese and chopped parsley.
* Avocado and mandarine orange slices.
* Hard-cooked egg slices with poppy seed dressing.

* Broiled peach half with cashew nut dust or sesame seeds.

* Broiled pineapple rings with spiced crab apples.

* Orange cups filled with cranberry relish.

* Broiled peach halves sprinkled with oregano seasoned bread crumbs.

* Cherry tomatoes filled with seasoned cottage cheese.

* Whole tomatoes filled with cole slaw. (Cut tomatoes almost through into sixths and spread open to give petal effect before adding cole slaw.)

SUGGESTIONS FOR GARNISHING

Garnishing is an art that can easily be acquired by following a few simple rules. It can be done with little additional time, effort or expense.

* Generally, garnishes should be edible, simple, natural and fresh.

* Garnishes for fish and shellfish should be suited to the character and size of the food product. For example, a pickle fan would be inappropriate to serve with a lobster tail.

* The flavor of edible garnishes should be in keeping with the food.

* Neatly arranged garnishes enhance the food. A flat, spreading garnish will make a dish appear smaller, whereas a perky lettuce leaf would give a seafood salad height.

* Colors should harmonize, never clash. Small quantities of the more vivid natural colors may be used to accent a food. Contrasting colors usually produce an artistic picture. Much seafood is neutral in color so a wide range of color treatment is helpful.

* The serving dish as well as the garnish used must be considered. A beautiful dish is an accessory to the food, so use it to your advantage.

* Temperature affects the appearance of the garnish. For hot dishes, select those that will not wilt.

The possiblities for garnishing are limited only be your imagination. You can add your own special color touch to make ordinary dishes look more attractive. Consider contrast of shape, color, texture and flavor when selecting garnishes.

A Touch of Red

Beets	cooked whole or sliced
Cherry peppers	whole
Cranberry sauce	whole or jellied
Paprika	sprinkled sparingly
Pimientos	strips or chopped
Radishes	whole, slices or roses
Spiced crab apples	whole
Tomatoes	slices or wedges

A Touch of Green

Avocados	peeled and sliced
Celery	tops, hearts, sticks or curls
Chives	chopped
Cucumbers	slices or sticks
Dill	sprigs or chopped
Green peppers	sticks or rings
Limes	slices, twists or wedges
Mint	sprigs
Parsley	sprigs or chopped
Pickles	whole or sliced

A Touch of Yellow and Orange

Carrots	sticks or curls
Hard-cooked eggs	slices, wedges
Lemons	slices, twists or wedges
Peaches	halves or slices
Pineapple	slices or wedges

VII. FISH AND SHELLFISH NUTRITION

FISH AND SHELLFISH NUTRITION

Both salt water and fresh water fish and shellfish are increasingly valuable sources of food for humans. Utilizing a wider variety of fish and shellfish species and handling them properly can make them an even greater asset to the family menu. In these days of high food prices, fishery products provide a relatively inexpensive and nutritious protein source.

Nutritive value is the ultimate test of the important of any food. The nutritive values of all types of fish and shellfish are approximately the same. Fish and shellfish are good sources of protein, minerals and vitamins. In addition, they are low in kilocalories.

PROTEIN

All fish and shellfish contain high quality protein. Although the protein content may vary between fish, the amino acid composition and quality of the protein are remarkably constant. A 3-ounce serving can supply the body with about one-third the total recommended amount of protein each day. The protein in fish is called a complete protein. This means that fishery products provide a good balance of amino acids needed to make and repair body tissue.

VITAMINS

Fishery products contain both fat soluble and water soluble vitamins. These are necessary for the growth and maintenance of healthy nerve tissue and normal operation of the body. Thiamin, riboflavin, miacin and vitamin B-12 are prevalent in fish and shellfish.

MINERALS

Fish and shellfish help supply the body's need for various minerals such as calcium, sodium, potassium, phosphorous, copper, iodine, magnesium, cobalt and other trace minerals. These are needed for building and maintaining sound teeth and bones and proper functioning of all body processes. Both fresh water fish and salt water fish are low in sodium. However, shellfish contain appreciable amounts.

FATS

Fats or oils found in fish are the polyunsaturated type. Of the fatty acids in fish, 60 to 85 percent is unsaturated. The fat content of fishery products varies widely, from less than 1 percent for cod or other white fleshed fish to 20 percent for salmon or mackerel. Fishery products with high oil content are excellent sources of vitamins A and D.

FISH AND SHELLFISH NUTRIENT COMPOSITION

Most of the following nutrient composition information concerns the raw product. The columns on water, protein, fat and carbohydrates indicate the percentage of each in the edible portion. Kilocalories are expressed as number of kilocalories per 100 grams (454 grams/pound) of edible product. This information is from "Composition of Foods", Agricultural Handbook No. 456, U.S. Department of Agriculture; and "Food Values of Portions Commonly Used", Bows and Church, 1975.

FISH AND SHELLFISH NUTRITIONAL VALUES

PRODUCT	WATER (%)	KILOCALORIES (per 100 g)	PROTEIN (g)	FAT (g)	CARBOHYDRATES (g)
Barracuda	75.4	113	21.0	2.6	0
Black sea bass	79.3	93	19.2	1.2	0
cooked with bacon, butter, onion	52.9	259	16.2	15.8	11.4
Bass, smallmouth and largemouth	77.3	104	18.9	2.6	0
Bass, striped	77.7	105	18.9	2.7	0
oven fried, milk, bread	60.8	196	21.5	8.5	6.7
White bass	78.8	98	18.0	2.3	0
Bluefish	75.4	117	20.5	3.3	0
baked or broiled, butter	68.0	159	26.2	5.2	0
fried, egg, milk, bread crumbs	60.8	205	22.7	9.8	4.7
Buffalo	77.4	113	17.5	4.2	0
Bullhead	81.3	84	16.3	1.6	0
Butterfish	78.2	95	16.2	2.9	0
Carp	77.8	115	18.0	4.2	0
Catfish, freshwater fillets	78.0	103	17.6	3.1	0
Clams, soft shell	85.8	54	8.6	1.0	2.0
Clams, hard shell	86.2	49	6.5	0.4	4.2
Clam fritters	40.3	311	11.4	15.0	39.9
Crab, steamed	78.5	93	17.3	1.9	0.5
Crab, deviled	63.3	188	11.4	9.4	13.3
Crappie	81.8	79	16.8	0.8	0
Crayfish	82.5	72	14.6	0.5	1.2
Croaker	79.2	96	17.8	2.2	0
baked	71.3	133	24.3	3.2	0
Grayfish	72.3	156	17.6	9.0	0
Drum, freshwater	77.0	121	17.3	5.2	0
Redfish (drum)	80.2	80	18.0	0.4	0
Fishsticks, cooked	65.8	176	16.6	8.9	6.5
Flounder, baked	58.1	202	30.0	8.2	0
Frog legs	81.9	73	16.4	0.3	0
Haddock	80.5	79	18.3	0.1	0
fried	66.3	165	19.6	6.4	5.8
smoked	72.6	103	23.2	0.4	0
Hake and Whiting	81.8	74	16.5	0.4	0
Mackerel	71.4	143	21.6	5.6	0
Kingfish	77.3	105	18.3	3.0	0
Trout, lake	70.6	168	18.3	10.0	0
Menhaden, canned	67.9	172	18.7	10.2	0
Mullet	72.6	146	19.6	6.9	0
Ocean Perch	79.7	88	18.0	1.2	0
fried, egg, milk, bread	59.0	227	19.0	13.3	6.8
frozen, breaded, fried, reheated	43.2	319	18.9	18.9	16.5
Oysters	84.6	66	8.4	1.8	3.4
fried	54.7	239	8.6	13.9	18.6
Yellow perch	79.2	91	19.5	0.9	0
Salmon, cooked	63.4	182	27.0	7.4	0
Shrimp, tails	78.2	91	18.1	0.8	1.5
fried	56.9	225	20.3	10.8	0
Swordfish, broiled	64.6	174	28.0	6.0	0
Rockfish	78.9	97	18.9	1.8	0
Sheepshead	75.9	113	20.6	2.8	0
Speckled trout	76.7	121	16.5	5.6	0
Tuna (raw)	66.2	177	25.3	7.6	0
Yellowtail	72.7	138	21.0	5.4	0

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