

HOME FREEZING OF

SEAFOOD

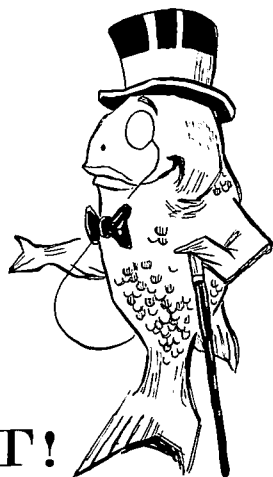


**BY KENNETH S.
HILDERBRAND**

*Extension Seafood
Technologist
Oregon State University*

PRESENTING...

OREGON'S FINEST!



Oregon seafoods are a delightful addition to your family meals. They provide excellent nutrition and help stretch your family food dollar.

Home freezing is an excellent method for preserving seafood and will be an added economy, since fresh seafood may be purchased in season when prices are generally lower.

Because some fresh seafood is seasonal, it is important to learn the availability of seafood in your area during certain times of the year. Your local fish dealer can provide you with this information and indicate the varieties that are most economical. Fresh fish may be purchased by the pound in any of the following forms—dressed, steaks, fillets and chunks.

One should keep in mind that exposure to air can cause color, flavor, and texture changes more rapidly with seafoods than with other foods. Although vacuum packaging, antioxidants, and other techniques are used by commercial packers to control these changes, the housewife must rely on more basic freezing methods and accept a shorter storage life.

The whole family will enjoy seafood from the freezer that tastes almost as fresh and delicately flavored as the day it was caught if a few rules are followed during preparation and storage.

SELECTING FRESH SEAFOOD



When purchasing seafoods for home freezing be sure they have not been previously frozen. Many fishermen freeze their catches as soon as they are landed. Refreezing seafoods usually results in poor quality, so consult your fish dealer to be absolutely certain.

When transporting fish or shellfish to the home keep them well iced. A few hours at room temperature can start spoilage. A few hours in the trunk of a car on a warm day can completely ruin many fish.

When buying fresh fish, look for the following characteristics: The flesh of whole or dressed fish should be firm and not separating from the bones. The odor should be fresh and mild.. If the head is attached, the eyes should be bright, clear, and full. As a fish becomes stale, the eyes become cloudy and often turn pink.

The gills should be red and free from slime and the skin should be shiny, with an unfaded color.

Crabs and crabmeat should have little "fishy" odor and no disagreeable ammonia-like taste or odor. The shell should not be slippery. Oysters and clams in the shell should be alive and the shells should close when handled. The nectar of shucked oysters should be clear and its meat should not contain air holes. There should be no sour smell or odor. Fresh shrimp should have no disagreeable odor and their meat or shells should not be slippery.

Remember, if ever in doubt as to the freshness of seafood, then by all means, do not freeze. If serious doubt is present, discard it.

Poor handling of fish prior to freezing will make it impossible to obtain good results. Freezing can only protect the quality of the fish as it was when frozen. In some cases poor handling can start chemical changes that even freezing cannot stop, such as oxidation of fats (caused by penetration of oxygen into the food).

CHOOSING THE PACKAGE



Most of the undesirable flavor and color changes in seafoods are caused by oxidation of chemically unsaturated oils and pigments. These are the same unsaturated fats which make seafoods nutritionally desirable.

Once oxidation starts it is almost impossible to stop. This is why careful handling and proper packaging before freezing is so essential.

Loss of water during frozen storage (freezer burn) not only dries and toughens foods, but promotes oxidation. Freezer burn is always accompanied by an "off" flavor, color, and odor.

"Cling" wrap material (polyvinylidene chloride film*) such as "Saran" or "Handywrap" is an excellent barrier to both water vapor and oxygen, clings well to surfaces, and is available in most grocery stores.

Metal cans with snap-on lids and glass jars designed for canning or freezing are good oxygen and water vapor barriers and are very useful for certain foods.

Waxed and polyethylene cartons or waxed bags are useful but may allow oxygen penetration and moisture escapement.

Polyethylene bags may be good moisture barriers but allow oxygen to pass into the contents.

*Although polyvinylidene chloride film ("cling wrap") is best for wrapping purposes, polyethylene bags are better suited to hold a number of small pieces of seafoods for freezing without leaking.

Note: Mention of commercial products herein is for descriptive purposes only and does not constitute endorsement of these products.

PREPARING SEAFOOD FOR FREEZING



Fish may be prepared in a variety of ways for freezing: Dressed or pan-dressed, steaks, and fillets. Usually, it is best to freeze fish in tightly wrapped package form as this takes less storage space and fits a family portion for one meal at a time. Fish freeze faster in wrapped packages, too.

To properly clean and dress fish, remove the scales by scraping with the dull edge of a knife. Remove the entrails by cutting the entire length of the belly from vent to head and remove all blood and kidney tissue. Then cut off the head above the collar bone.

Next, break the backbone over the edge of the cutting board or table and remove the dorsal or large back fin. This is best done by cutting the flesh along each side of the fin and pulling it out.

Wash the fish thoroughly in cold running water. It is now ready for the freezer or to be prepared into steaks.

Steaks are prepared by cutting the fish crosswise about three-fourths of an inch thick. Fillets are cut with a sharp knife from each side of the fish from head to tail. Sole, perch, and flounder need not be eviscerated before filleting.

Pink shrimp that is available on the market is usually already cooked and peeled and ready to eat or freeze. In coastal areas it is sometimes possible to buy unpeeled shrimp at a considerable savings. One pound of raw shrimp will yield about one cup of cooked peeled shrimp, weighing about four ounces. With a little practice, one can soon become fairly adept at peeling the shrimp.

Prepare live crab to be picked by removing the back shell and breaking the crab in half, front to back, and shaking out viscera. Then thoroughly clean the crab under a flow of fresh water. Remove any newly forming shell (a jelly-like substance containing dark pigments). Some people prefer the flavor of crab cooked with the back on (24-25 minutes in boiling water).

After cooking, cool the crab for handling and pick the meat while warm from the body and legs. Keep the body and leg meats separate when handling and packing to prevent running of the red

pigment.

Crabs may also be steam cooked at 212 to 214 degrees Fahrenheit in your pressure cooker for 12 to 15 minutes. Boiling the crabs in water tends to remove some of the flavor, but takes less time.

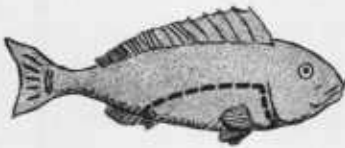
Clams should have external sand and dirt removed. Sometimes allowing them to stand in cool fresh water or a weak saltwater solution for several hours will remove most internal dirt and sand. All frying and chowdered clams should be carefully washed in fresh water.

Open clams raw with a knife (cut both adductor muscles with knife point) or pour boiling water over them until they open. Remove the shell (and neck "skin" on some species). Slit the neck (or siphon) lengthwise and open the stomach to clean. Wash the meat thoroughly.

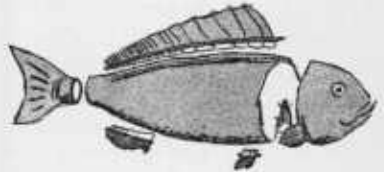
Oysters should be washed with a strong spray before removing the whole meat including the eye (adductor muscle) from its shell. Collect the meats in a strainer to allow drainage. The drained liquor or nectar may be used to cover the surface of the meats when packaging.

Wash the oyster meats thoroughly in a salt solution to free them of sand and dirt and then drain.

Figure 1. Some of the forms in which fish are cut for freezing:



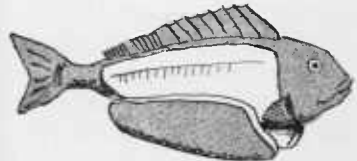
Drawn — whole fish with entrails removed.



Dressed or pan-dressed — whole fish with scales and entrails removed, usually with head, tail, and fins removed.



Steaks — cross-section slices from large dressed fish.



Fillets — sides of the fish, cut lengthwise away from the backbone.

WRAPPING SEAFOOD FOR THE FREEZER



Generally speaking, pan-dressed or small whole fish (such as smelt), and fish steaks or fillets—raw or cooked—are easy to prepare for packaged freezing and should be tightly pre-wrapped individually in “cling” wrap (polyvinyl chloride film), forming a tight “skin” on the product. These individually wrapped items should then be “master bagged” in a good strong polyethylene bag before freezing but never more than about one pound per “master bag.”

Wrapping seafoods individually allows pieces to be thawed separately and more quickly—only the quantity desired needs to be thawed.

Pre-dipping raw seafoods in a precooked and cooled solution of five percent starch mixed in water will help exclude air from the individual pieces. (Use about six tablespoons of corn starch per gallon of water). The starch must be rinsed away after the item is thawed and before cooking.

Large fish and shellfish in their shell have large surface areas exposed and are difficult to protect from oxidation. The best way to handle these fish is to simply freeze them unwrapped or temporarily bagged in plastic. After freezing, dip them in water to form a protective “glaze.” The fish can then be rebagged and returned to the freezer. The glaze may need renewing every five to six weeks.

Another technique for smaller fish is to freeze them in a can or carton filled with water. If the fish cannot be tightly packed in the container, it would be best to add the water after the fish is frozen. This will allow for quicker freezing of the individual fish and the addition of a protective glaze later.

A disadvantage to this method is the longer time required to thaw the entire package to remove any portion of its contents.

Meat from smaller seafoods—raw or cooked—can be frozen in a strong jar or can, or in a waxed or plastic carton. If natural juices do not cover the product a small amount of water can be added if desired (although this may remove some of the flavor of cooked foods). Be sure to leave $\frac{1}{2}$ to $1\frac{1}{4}$ inches of space at the top of the container for

expansion. This is very important to prevent breakage when using glass jars. In some cases it may help to protect the top layer of food by "capping" it with fresh water after the bulk of the container has been frozen.

Again, the importance of excluding as much air as possible from the package cannot be overemphasized.

Besides preventing oxidation, air will act as an insulator and slow the freezing process. Any pocket of air between the package wall and its contents will promote the formation of ice crystals. When the package is cooled and frozen, water will move from the seafood to the inside wall of the package. If the product is warmed slightly (during defrost or each time the freezer door is opened) the moisture may move from the package surface back to the food surface. When the package cools again, the cycle is repeated. This may continue until a large quantity of water is removed from the food and it is severely dehydrated and of very poor quality.

IMPORTANT: Never leave smoked or kippered fish in a tightly wrapped package after it has thawed. Some smoking methods do not insure complete destruction of *Clostridium botulinum* spores which may be harmful when smoked fish is stored over a few weeks in an air-tight container.

Figure 2. Types of containers and wrappings for freezing seafood, readily available at your local market.



LABELING

SEAFOOD FOR THE FREEZER



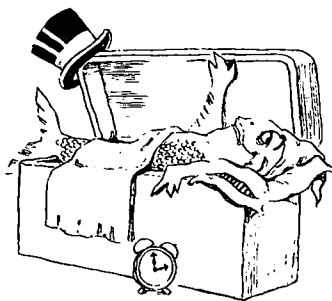
Trying to guess the age and contents of a frozen package of seafood can be frustrating and wasteful. Many times food is discarded because its storage age is unknown. Although it is unlikely that properly frozen and stored food can become harmful at any age, top quality demands that extended storage be avoided.

Label each package with date, kind, and type of seafood and weight and number of servings or pieces. A crayon or grease pencil is ideal for this purpose.

A record attached near the freezer will also be helpful and should carry the same information included on the package as well as the location of each package in the freezer, the package size, and a current record of the number of packages put into or removed from the freezer. This prevents unnecessary searching for a particular package and the harmful warming of contents while the freezer door is open.

STORING

SEAFOOD IN THE FREEZER



Usually the faster any food is frozen the better the quality and the longer the storage life. This is partly because of less cell destruction by freezing. Slow freezing may actually allow bacterial and enzymatic spoilage while the food is in a semi-frozen state.

To obtain the fastest freeze, place the packages in direct contact with the freezer floor or walls until they are frozen. If the packages take more than five to six hours to freeze, they are too large.

Packages should be stored at zero degrees Fahrenheit (or colder) where the temperature does not fluctuate. Generally, the farther away from the freezer door, the more stable the temperature. As mentioned before, temperature fluctuation can be harmful to frozen seafoods.

Although commercial packaging may allow over a year of good shelf life, freezing methods available in the home will not generally permit seafood to be stored that long and still maintain its flavor and texture. Most home frozen seafood should not be stored over six months and not more than three months for salmon, crab, and shrimp.

A good rule for a continuous supply of high-quality frozen foods is "first in—first out."

One to two months storage for all seafoods is ideal. Seafoods are very delicate in flavor and texture and deserve to be eaten at the peak of quality.

THAWING SEAFOOD



The method to thaw seafood is almost as important as proper freezing. Usually, the quicker a product is thawed, the better (but not in hot water).

Thawing can be done in the refrigerator—but it's slow. It can take several days if the refrigerator is near 32 degrees Fahrenheit. Spoilage can easily take place during this thaw period.

Surface spoilage can take place quickly when thawing at room temperature or in warm water if the surface of the package remains at that temperature for several hours. Never thaw in hot water!

The best method for thawing usually depends on the package. Use running cold tap water on containers and large packages that are water tight (if properly packaged, they *should* be water tight). As soon as the package contents can be pulled apart, they can be thawed in the refrigerator.

Seafood that can be separated while frozen (such as individually wrapped fillets), can be thawed at room temperature, then in the refrigerator if they need to be held a few hours before cooking.

WANT MORE *INFORMATION?*

For suggestions on catching, preparing and cooking seafood found on the Pacific coast write for the following bulletins:

Cooperative Extension Service Publications
Oregon State University
Corvallis, Oregon 97331

Ext. Circular No. 744 – “Catching, cleaning and cooking bay crabs”	free
Ext. Circular No. 729 – “Food Spoilage”	free
Ext. Circular No. 790 – “Game Foods”	free
Ext. Bulletin No. 820 – “Prepared and Precooked foods for the freezer”	free

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Home and Garden Bulletin No. 40 – “Freezing combination main dishes”	10 cents
Home and Garden Bulletin No. 93 – “Freezing meat and fish in the home”	20 cents
Home and Garden Bulletin No. 162 – “Keeping food safe to eat”	10 cents

Oregon Fish Commission
307 State Office Building
1400 S.W. 5th
Portland, Oregon 97201

Ed. Bulletin No. 2 – “The Bay Clams of Oregon”	free
Ed. Bulletin No. 4 – “Razor Clams”	free



OSU Marine Advisory Program

Cooperative Extension work in Agriculture and Home Economics, Joseph R. Cox, acting director. Oregon State University and the U.S. Department of Agriculture cooperating. Printed and distributed in furtherance of Acts of Congress of May 8 and June 30, 1914.

This information is published by Oregon State University as part of the National Science Foundation Sea Grant program.