Oregon seafoods are a delightful addition to your family meals. They provide excellent nutritional value and add variety to your family meals. Home freezing is not only an excellent method for preserving seafood, but it's also an added economy, whether you catch seafood yourself or buy in season (when the prices are generally lower).

Because some fresh seafood is seasonal, it's 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.

Keep in mind that exposure to air can cause color, flavor, and texture changes more rapidly with seafoods than with most other foods. Although vacuum packaging, antioxidants, and other techniques are used by commercial packers to control these changes, you'll usually rely on more basic freezing methods and expect a shorter storage life. If you catch your own...

Fishermen should be aware that the process of stiffening (rigor mortis) of freshly caught fish has a significant influence on the quality of the frozen product. The best quality is produced from fish that have been handled and frozen immediately after the process of rigor is over and the fish muscle is relaxed.

Fish iced immediately after catch may take more than a day to go slowly through a gentle rigor. On a warm day, un-iced fish may suffer some flesh damage from a harsh rigor in only a few hours, especially if it's still stiff when you handle it.

Fish flesh that has been frozen before going through rigor should have excellent flavor, but it may be slightly tough if you thaw it before 8 weeks storage.

However, you'll often have little influence over how your fish is handled or filleted, and you shouldn't be overly concerned about the consequences. The best advice is simply to keep it as cool as possible. If you follow a few rules during preparation after catch, ice the flesh immediately after butchering or filleting, and don't freeze it as soon as possible.

Remember: If you're ever in doubt as to the freshness of seafood, then by all means, don't freeze. If you have a serious doubt, discard it.

Poor handling of fish before freezing will make it impossible to obtain good results. Freezing can help protect the quality of the fish as well as when frozen.

In some cases, poor handling can start chemical changes that even freezing can't stop, such as oxidation of fats (caused by penetration of oxygen into the food).

For addition information on selecting fresh or frozen tuna, read SG 82.

Choosing the package

Most of the desirable flavor and color changes in seafoods are caused by oxidation of chemically unsaturated oils and pigments. These are unsaturated fats that make sea foods nutritionally desirable. Once oxidation starts, it is almost impossible to stop. This is why careful handling and proper packaging before freezing are essential.

Loss of water during frozen storage can cause foods to dry and toughen. Freezing can't stop this, but it also promotes oxidation. Freezer burn is always accompanied by "off" flavor, color, and odor.

Commercial packers manufacture for freezer use, will also use vacuum-sealing machines are the best method of preparing seafood for freezing. However, open packages immediately after thawing.

Glass jars and plastic containers made for canning and freezing are good choices. Freezer paper, as well as plastic bags and cling plastic wrap manufactured for freezer use, will also prevent moisture loss and oxygen from contacting frozen seafood.

Preparing seafood

You can prepare fish for freezing in a variety of ways—dressed or pan-dressed, steaks, and fillets (see figure 1). Usually, it's best to freeze fish in

Kenneth S. Hilderbrand, Jr., Extension seafood technologist, Oregon State University. This publication, which replaces SG 7, was prepared with the assistance of Carolyn A. Raab, Extension food and nutrition specialist, Oregon State University.
tightly wrapped package form. This takes less storage space and fits a family portion for one meal at a time. Fish freeze faster in tightly 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.
- Remove all blood and kidney tissue.
- Cut off the head above the collar bone.
- Break the backbone over the edge of the cutting board or table and remove the dorsal or large back fin (it's best to cut the flesh along each side of the fin and pull it out).
- Wash the fish thoroughly in cold running water. It's now ready for the freezer, or you can prepare it for steaks.

Prepare steaks by cutting the fish crosswise into slices about 3/4 inch thick. Cut fillets with a sharp knife from each side of the fish from head to tail. You don't need to eviscerate flat fish and perchlike fish before filleting.

Shrimp. Usually, pink shrimp that's available on the market is already cooked and peeled and ready to eat or freeze.

Live crab. Prepare by removing the back shell and breaking the crab in half, front to back, and knocking out viscera. Then thoroughly clean the crab under a flow of fresh water. Remove any new developing shell jellylike substance containing dark pigments. Some people prefer the flavor of raw crab with the back left intact.

Clams. Remove external sand and dirt. Sometimes, allowing them to stand in cool fresh water or a weak saltwater solution for several hours will remove most internal sand and dirt. Wash all clams carefully in fresh water.

Open raw clams 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. Wash with a strong spray before you remove the whole meat, including the eye (adductor muscle), from its shell. Collect the meats in a strainer to allow drainage.

Wash the oyster meats thoroughly in a mild salt solution to free them of sand and dirt and then drain. Commercially shucked oysters are ready to freeze.

Wrapping seafood

Figure 2 shows several types of wrappings and containers.

Generally speaking, pan-dressed or small whole fish (such as trout), and fish steaks or fillets (raw or cooked) are easy to prepare for packaged freezing. Prewrap them tightly and individually (double thickness if possible) in "cling" wrap, forming a tight "skin" on the product.

"Master-bag" these individually wrapped items in a good strong polyethylene bag or foil before freezing—but never more than 1 pound per master bag.

Wrapping seafoods individually lets you thaw pieces separately and more quickly—thaw only the quantity you want.

Large fish and shellfish in their shell have large surface areas exposed, and they're difficult to protect from oxidation. The best way to handle these fish is simply to freeze them unwrapped or temporarily bag them in plastic.

After freezing, dip them in water to form a protective glaze. Then you can rebag the fish and return it to the freezer. The glaze may need renewing every 5 to 6 weeks.
Figure 2.—Types of containers and wrappings for freezing seafood, readily available at your local market. (Brand-name products are shown here as examples only; their depiction does not mean that the OSU Extension Service endorses these products or intends to discriminate against products not pictured.)

Another technique for smaller fish is to freeze them in a can or carton filled with water. If you can't tightly pack the fish in the container, add ice cold water after the fish is frozen. This will allow quicker freezing of the individual fish, and it will add a protective glaze later.

Note that this method has two disadvantages:
1. You'll need more time to thaw the entire package to remove any portion of its contents.
2. Some seafoods have a tendency to leach out flavor and color.

Meat from smaller seafoods—raw or cooked—can be frozen in a strong jar or can, or in a new waxed or plastic carton. If natural juices don't cover the product, you can add a small amount of water if you wish. Be sure to leave ¼ to ½ inch of space at the top of the container for expansion. This is very important to prevent damage when you use glass jars. In some cases, 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, we can't overemphasize the importance of excluding as much air as possible from the package. Besides promoting 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 being 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's severely dehydrated and of very poor quality.

If you use a vacuum packaging machine, be sure to follow the manufacturer’s directions and freeze the package immediately after sealing. Also remember to open the package to allow for air circulation immediately after thawing.

Labeling seafood

Trying to guess the age and contents of a frozen package of seafood can be frustrating and wasteful. Many times, people discard food because they don't know how long it's been stored. Although properly frozen and stored food isn't likely to become harmful at any age, top quality means that you must avoid extended storage.

Label each package with the date, time, and type of seafood, and the 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. It should carry the same information you placed 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 you've 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

Usually, the faster any food is frozen, the better the quality and the longer the storage life. This is partly because there's less cell destruction during freezing. Slow freezing may actually allow bacterial and enzymatic spoilage while the food is in a semifrozen state.

Home freezers are designed for storage, not rapid freezing. A good rule of thumb is that a home freezer can properly freeze about 1 to 2 pounds per cubic foot in 24 hours.
Don't overload your freezer, and don't pack the unfrozen seafood too tightly—either of these practices can greatly extend the freezing time and reduce the quality.

To obtain the fastest freeze, place the packages in direct contact with the freezer floor or walls until they're frozen. If the packages take more than 5 to 6 hours to freeze, they're too large.

Store your packages at 0°F or colder, where the temperature doesn't fluctuate. Generally, the farther away from the freezer door, the more stable the temperature. As we mentioned before ("Wrapping," page 3), temperature fluctuations can harm the quality of frozen seafood.

Although commercial packaging may allow over a year of good shelf life, freezing methods available in the home won't generally permit storing seafood that long and maintaining its flavor and texture.

Most home-frozen seafood shouldn't be stored over 6 months—not more than 3 months for salmon and crab.

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

For really good eating, store seafood 1 to 2 months—no more. Seafoods are very delicate in flavor and texture, and they deserve to be eaten at the peak of quality.

Thawing seafood

Proper thawing of seafood is almost as important as proper freezing. Usually, the quicker you thaw a product, the better (but not in hot water).

You can thaw in the refrigerator, but it's slower and can take several days if the refrigerator is near 40°F.

You can also thaw seafood in a microwave oven. Follow the manufacturer's instructions.

Surface spoilage can take place quickly when you thaw 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 they're properly packaged, they should be watertight). As soon as you can pull the package contents apart, you can thaw them in the refrigerator.

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

Important: Open vacuum-sealed seafoods after you thaw them to allow air to enter the package. Never leave smoked or kippered fish in a tightly wrapped or vacuum package after it has thawed.

Some smoking methods don't ensure complete destruction of Clostridium botulinum spores, which may be harmful if you store smoked fish unfrozen over a few weeks in an airtight container.

Want more information?


SG 22, Preparation of Salt Brines for the Fishing Industry. 25¢

SG 28, Oregon’s Captivating Clams. Revised 1987. 50¢

SG 30, Catching, Cleaning, and Cooking Bay Crabs. Revised 1990. 50¢

SG 32, Life Begins at 40°F: How to Use a Seafood-Handler’s Thermometer. 25¢

SG 61, Smelt Abounding! Dip Net to Dish. 25¢

SG 70, Building a Small Crab Cooker for Home Use. 25¢

SG 76, How to Identify a Softshell Crab. Single copy, no charge.

SG 82, Albacore Tuna: A Quality Guide for Off-the-Dock Purists. 25¢

PNW 183, Fish Pickling for Home Use. Single copy, no charge.

PNW 194, Canning Seafood. Revised 1990. 25¢

These publications (and the one you’re reading, EC 1363, Home Freezing of Seafood, 25¢) are available for order.

Publications Orders

Agricultural Communications

Oregon State University

Administrative Services A422

Corvallis, OR 97731-2119

Shipping and handling: For orders up to $2.50, please include 25¢. For orders between $2.50 and $100, include 15%. For orders of $100 or more, or for 100 copies or more, please call Agricultural Communications (503-737-2513) for a quote on reduced shipping rates.

Extension Service, Oregon State University, Corvallis, O.E. Smith, director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.

The Extension Sea Grant Program is supported in part by the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

Oregon State University Extension Service offers educational programs, activities, and materials—without regard to race, color, national origin, sex, age, or disability—as required by Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University Extension Service is an Equal Opportunity Employer.