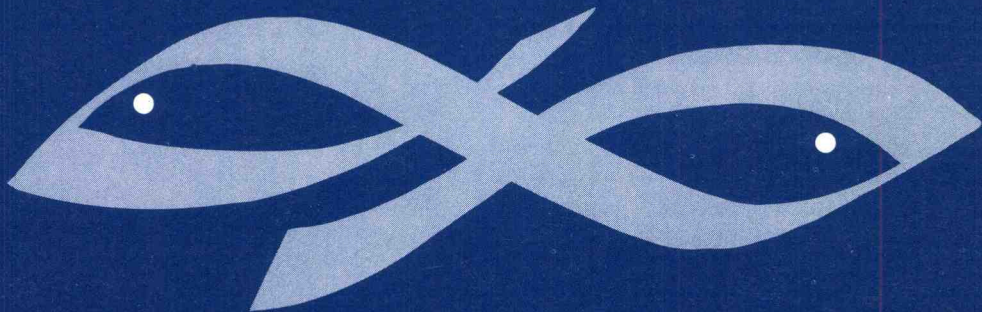


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CANNING SEAFOOD



A Pacific Northwest Extension Publication
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Canning Seafood

Coastal waters, lakes and streams in the Pacific Northwest provide a variety of seafoods, including salmon and many other fish, clams, oysters, shrimp, and crab. These delicacies can be enjoyed throughout the year if they are preserved when supplies are abundant. Canning is the method of preservation commonly used. Seafoods are high in quality and safe to eat when canned correctly.

Canning Fish and Shellfish

Can only fresh seafoods. To prevent spoilage, keep fish and shellfish cool, on ice or in a refrigerator. Can as soon as possible after catching or purchasing. The quality goes down rapidly.

Preparation

- Prepare fish as directed.
- Soak or cook shellfish in water containing salt, acid, or both, as directed. Either lemon juice or white vinegar can be used to prevent discoloration of light-colored shellfish. Citric acid, which is sometimes recommended, can be purchased at pharmacies.

Packing

- Pack fish and shellfish into pint or half-pint jars as directed. Safe processing times have not been determined for quart jars.
- Tip: Use a jar funnel or cover the rim edge with foil to prevent buildup of fat. Remove foil before sealing.
- Raw fish is generally packed without adding liquid. Some people prefer to add 1 to 3 tablespoons vegetable oil or French-style dressing per pint.

- Wipe the jar rims clean with soapy paper towel before sealing with the lid. (Fat or food particles will prevent sealing.)

Processing

- Process seafoods in a pressure canner as directed. The high temperatures reached under pressure are necessary to destroy bacteria that cause spoilage and food poisoning.

- Use a pressure canner that is in good condition. Replace the gasket if necessary. Dial pressure gauges should be checked for accuracy at least once a year. (Your county Extension office can tell you where to have your gauge tested.)

- Re-read and follow directions for the canner. If you no longer have an instruction manual, write the manufacturer.

- Exhaust the steam from the canner. Canner directions will specify if this is manually done by allowing a flow of steam from the canner for 10 minutes or if this venting step is automatically controlled.

- Process foods at the correct pressure. At sea level, process foods at 10 pounds pressure. Increase the pressure $\frac{1}{2}$ pound for each 1,000 feet altitude above sea level. (At 2,000 feet process at 11 pounds pressure, at 4,000 feet process at 12 pounds pressure.) If a canner has a weighted gauge, process at 10 pounds at altitudes below 2,000 feet, 15 pounds above 2,000 feet.

For pressure canners that have only a 15-pound pressure capacity, follow processing time directions that come with canner.

Questions Frequently Asked

- *Is it safe to process seafoods in a boiling water bath?*

The temperature must be above the boiling point of water to destroy *Clostridium botulinum* spores. If seafoods are not processed in a pressure canner, these spores will grow and produce the toxin that causes botulism.

- *Can seafoods be processed at 15 pounds pressure?*

Although processing at 15 pounds pressure is recommended in certain instruction manuals, there is no added advantage in terms of safety, quality, or nutritive value.

- *What causes darkening of canned crab?*

Canned crab will not be as light in color as fresh crab. However, the color can be kept as light as possible by using an acidic brine as directed.

- *Is it safe to leave salt out of canned seafood?*

Salt is only added as a flavoring. When a range is given, add the amount that is suitable for your own taste.

- *Glass-like crystals sometimes form in canned salmon. Are they harmful?*

It is safe to eat these crystals which are magnesium ammonium phosphate. There is no way for the home canner to prevent their formation, but they usually dissolve when heated.

To make sure that the pressure stays constant during processing, check the gauge periodically. Weighted gauges should jiggle or rock the number of times per minute specified in canner directions.

- Process foods for the correct length of time. When the required pressure is reached, write down the time and continue processing for the specified period. Remove canner from the heat at the end of the processing time.

Processing times listed in this publication are based on 10 pounds pressure. When using a pressure saucepan, add 20 minutes to the processing time to compensate for faster heating and cooling.

Test seals on jars within 24 hours. If jars have not sealed, use a new lid and reprocess in the canner for the entire length of time. As an alternative, refrigerate the product for use within the next few days, or freeze it.

Salmon, trout, steelhead, and all other fish (except tuna)

1. When fish are caught, remove viscera at once. Chill the cleaned fish until ready to can.

2. Before canning, remove head, tail, fins, and scales. Wash fish carefully, removing all blood.

3. Split fish lengthwise. Cut into lengths suitable for jars.

4. Pack fish tightly into jars, leaving 1 inch head space. One teaspoon salt per pint may be added.

5. Adjust lids and process half-pints and pints for 100 minutes at 10 pounds pressure.

**Recommended Processing Times at
10 Pounds Pressure**

Seafood	One-half pint jar	Pint jar
	Minutes	Minutes
Raw fish	100	100
Smoked fish	100	100
Whole clams	60	70
Minced clams	60	70
Crab	70	80
Oysters	75	75
Shrimp	45	45

Safe processing times have not been determined for quart jars.

Smoked fish

1. Cut smoked fish into lengths suitable for jars.

2. Pack into jars, leaving 1 inch head space.

3. Adjust lids and process half-pints and pints for 100 minutes at 10 pounds pressure.

Safe processing times have not been determined for other smoked seafoods. These products should be frozen.

Tuna

1. Tuna can be canned either precooked or raw. Precooking removes most of the oil that tends to be strong flavored; however, many people find it easier to can the tuna raw in its own juices.

2. To precook, remove viscera and wash fish well in cold water. Allow blood to drain from the cavity. Place cleaned tuna on a rack or metal tray placed in the bottom of a large baking pan. Bake fish at 225° to 250° F (110° to 120° C) for 2½ to 4 hours depending on size; or bake 350° F (180° C) for about 1 hour. In place of baking, the tuna can be steamed for 2 to 4 hours. The internal temperature of the fish should reach 165° to 175° F (70° to 80° C). Refrigerate the fish overnight to firm the meat.

3. When canning raw tuna it is easier to fillet if the fish is partially frozen. The raw fish can be skinned before or after filleting. It is not necessary to remove the viscera before filleting raw tuna.

4. For either raw or precooked, peel off skin with a sharp knife, lightly scraping surface to remove blood vessels and any other discolored flesh.

5. Separate the fish into quarters by cutting meat away from the bones. Pull off and cut out all bones and fin bases. Scrape and cut out all dark flesh. The dark flesh has a strong flavor and can

affect the delicate tuna flavor. Many people prefer not to can this part. It makes excellent pet food.

6. Cut quarters crosswise with a sharp knife into lengths suitable for jars. Pack pieces into jars, pressing down gently to make a solid pack. Leave 1 inch head space.

7. For precooked tuna, add ½ teaspoon salt and 1 to 3 tablespoons oil (cottonseed, soy, or other vegetable oil) per half pint; 1 teaspoon salt and 2 to 6 tablespoons oil per pint. If you prefer, use water instead of oil. For raw pack tuna no added liquid is needed. Salt is optional.

8. Adjust lids and process half pints and pints for 100 minutes at 10 pounds pressure.

Clams, whole

1. Keep live clams cool until ready to can. Wash shells and steam to open. Remove meat, saving juice.

2. Wash meat in a weak salt brine (1 to 3 tablespoons salt per gallon of water).

3. Blanch meat for 1 to 2 minutes in boiling acidic solution of 2 tablespoons vinegar or lemon juice per gallon of water. (½ teaspoon of citric acid dissolved in 1 gallon of water may also be used.)

4. Drain meat and pack into jars, leaving 1 inch head space. Pour hot juice over clams. Add boiling water, if needed, leaving 1 inch head space.

5. Adjust lids and process half-pints for 60 minutes, pints for 70 minutes at 10 pounds pressure.

Clams, minced

1. Follow steps 1 through 3 for whole clams.

2. Drain blanched meat and grind, using a meat grinder or food processor.

3. Pack 4 ounces (about ¾ cup) into half-pint jars and 7 ounces (about 1½ cups) into pint jars, leaving 1 inch head

space. Cover with hot clam juice. Add boiling water, if necessary, leaving 1 inch head space.

4. Adjust lids, and process half-pints for 60 minutes, pints for 70 minutes at 10 pounds pressure.

Crab

1. Keep live crabs cool until ready to use. Clean crabs before or after cooking. Some people prefer the flavor of crabs cleaned before cooking while others prefer to cook the live crabs and then clean. Both methods are acceptable.

2. Cook cleaned or live crabs in boiling acidic brine (2 tablespoons to 1 cup salt, as desired, and $\frac{1}{4}$ cup white vinegar or lemon juice per gallon of water) for 20 minutes.

3. Cool crab in cold water and then drain. Remove meat from body and claws.

4. Rinse crab in cool acidic brine (2 tablespoons to 1 cup salt and 1 to 2 cups white vinegar or lemon juice per gallon of water). Squeeze the meat to remove excess moisture.

5. Pack into half-pint or pint jars, leaving 1 inch of head space. Add 1 tablespoon of white vinegar or lemon juice per half pint, 2 tablespoons per pint. ($\frac{1}{2}$ teaspoon of citric acid per half pint may also be used.) Cover with boiling water, leaving 1 inch head space.

6. Adjust lids and process half pints for 70 minutes, pints for 80 minutes at 10 pounds pressure.

Oysters

1. Keep live oysters cool until ready to can. Wash shells and steam to open. Remove meat.

2. Wash meat in weak salt brine ($\frac{1}{2}$ cup salt per gallon of water).

3. Drain meat and pack into jars, leaving 1 inch head space. Cover with a weak salt brine (about 1 tablespoon of salt per quart of water).

4. Adjust lids and process pints and half-pints for 75 minutes at 10 pounds pressure.

Shrimp

1. Remove heads as soon as shrimp are caught. Chill until ready to can.

2. Wash and drain shrimp.

3. Cook shrimp 8 to 10 minutes in boiling acidic brine ($\frac{1}{4}$ to 1 cup salt and 1 cup vinegar per gallon of water). Rinse in cold water and drain.

4. Peel shrimp.

5. Pack into jars, leaving 1 inch head space. Cover with boiling salt brine (1 to 3 tablespoons salt per gallon of water).

6. Adjust lids and process half-pints and pints for 45 minutes at 10 pounds pressure.

Using Home-Canned Seafood

Examine home-canned seafood for spoilage before serving it. Bulging jar lids, spurting liquid, an "off" odor or mold indicate that the food is not safe to eat. Discard spoiled food out of the reach of pets. *Do not even taste questionable food.*

It is possible for underprocessed home-canned seafood to contain the botulinum toxin without showing signs of spoilage. For an extra margin of safety, home-canned seafood should be heated after opening the jar. Boiling the seafood for 15 minutes on the stove will destroy the toxin. To prevent undesirable texture changes, heating in the oven is a more satisfactory method for home-canned fish.

The following oven method for heating home-canned fish is suggested.

- Open the jar of fish and examine for spoilage. If spoilage is evident, discard the fish (without tasting) out of the reach of pets. Wash the lid before discarding or reusing it on the jar.

- Insert a meat thermometer upright into the center of the jar. The tip should be at the approximate center of the fish.

- Cover the jar loosely with foil and place in an oven preheated to 350° F (180° C).

- Remove the jar from the oven when the thermometer registers 185° F (85° C). About 30 to 35 minutes will be needed.

- Let the jar stand at room temperature for about 30 minutes. This will allow the temperature to become uniform throughout. By using a thermometer to determine the temperature of the fish, this heat treatment is equivalent to "boiling."

- Serve the fish hot or refrigerate immediately for later use.

- Note: Seafood used in a casserole dish baked at 350° F (180° C) may be

baked as usual and the temperature checked at the end of the cooking as outlined above for jars.

**Approximate Metric Equivalents
for Metric Conversion**

Pressure

1 pound per square inch 6.9 kilopascals

Length

1 inch 2.5 centimeters
1 foot 0.3 meter

Mass

1 ounce 28 grams

Volume

1 teaspoon 5 milliliters
1 tablespoon 15 milliliters
1 cup 250 milliliters
1 quart 1 liter
1 gallon 4 liters



Prepared by Carolyn A. Raab, Extension food and nutrition specialist, Oregon State University, in consultation with Extension food specialists at Washington State University and the University of Idaho. Research to develop a safe oven method for reheating canned fish was conducted by Margy Woodburn, head, Foods and Nutrition Department, Oregon State University. Research to verify that seafoods are safe when canned as directed was funded by the OSU Sea Grant College Program, under grant 04-7-158-44085.

PNW 194

Revised January 1983

Published and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914, by the Oregon State University Extension Service, Henry A. Wadsworth, director; Washington State University Cooperative Extension, J. O. Young, director; the University of Idaho Cooperative Extension Service, H. R. Guenther, director; and the U. S. Department of Agriculture cooperating.

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