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Great Lakes Fish Preparation

Michigan State University

Cooperative Extension Service

Michigan Sea Grant Program, Advisory Service

Upper Great Lakes Regional Commission

A. Estes Reynolds, Extension Specialist, Food Science and Human Nutrition

Suzanne Tainter, Assistant Editor, Fisheries and Wildlife

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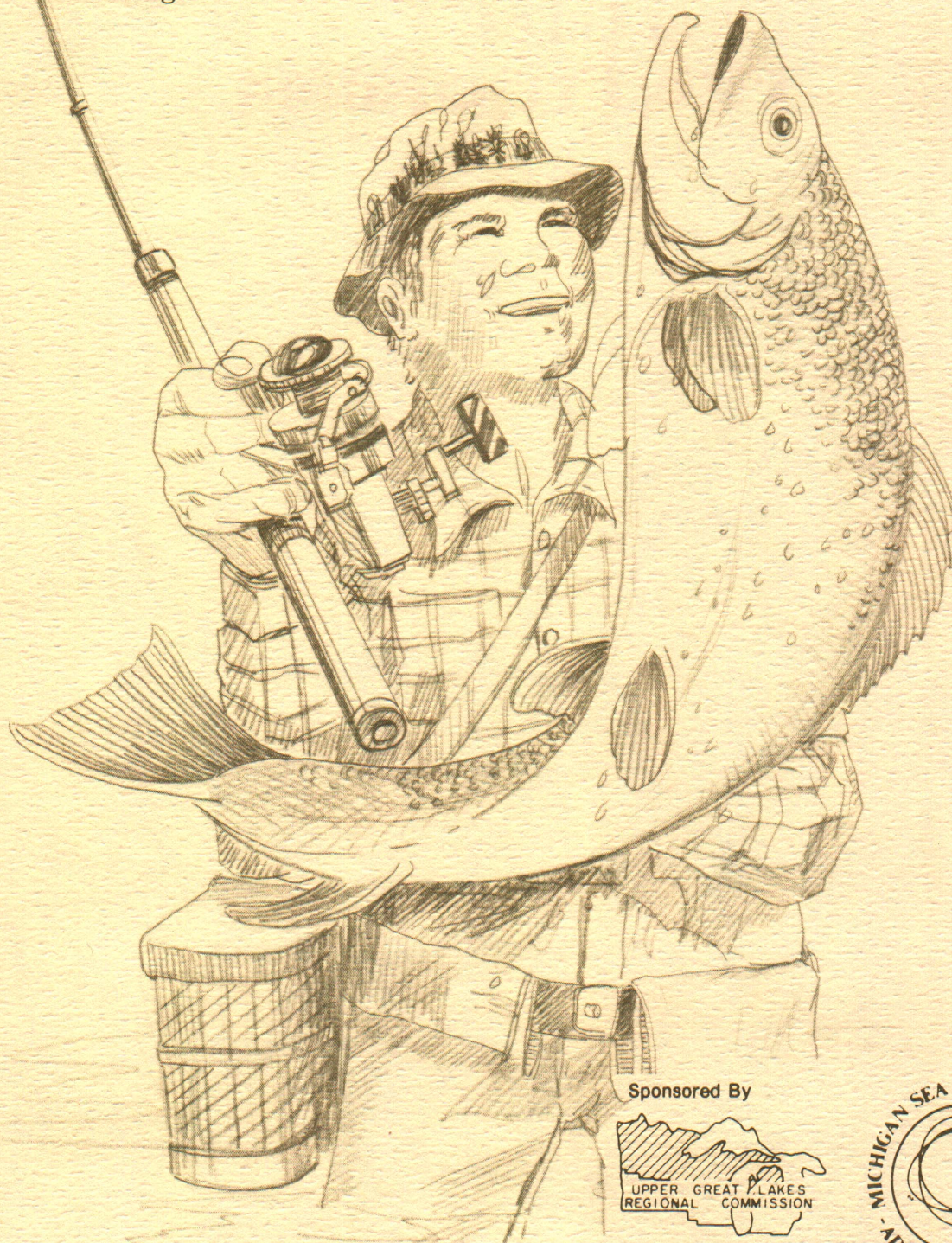
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Great Lakes Fish Preparation

Extension Bulletin E-1179

Michigan Sea Grant Publication MICHU-SG-78-100



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COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY

Great Lakes Fish Preparation



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by

A. ESTES REYNOLDS

Extension Specialist, Food Science and Human Nutrition

and

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Assistant Editor, Fisheries and Wildlife

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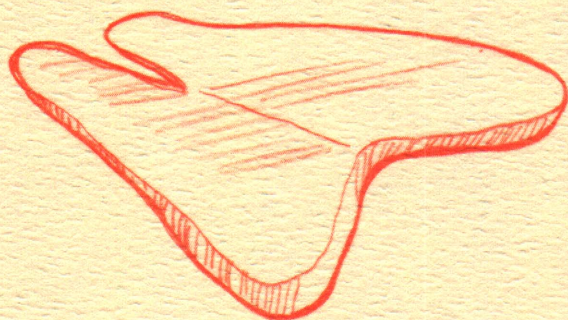
Consumer Marketing Information Agent (retired)

THERE IS ALWAYS something fishy going on in Michigan. That is understandable with over 11,000 inland lakes, 2,000 miles of Great Lakes shoreline and 36,000 miles of streams.

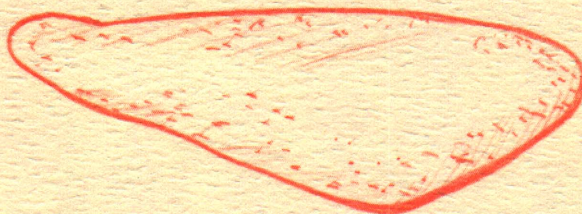
Besides the many thousands who enjoy fishing for sport, the commercial fishing industry has long supplied restaurants and markets with Great Lakes fish.

Whether you catch fish in lakes and streams, or catch up with them at the market, fish available in Michigan provide a wealth of varied and delightful eating.

There is no finer food than fish. The meat is tender, delicately flavored and cooks quickly. Fish are 85 to 95 percent digestible, making the nutrients readily available to our bodies. Fish provide well balanced protein. One 4-ounce serving supplies about $\frac{1}{3}$ the amount of protein nutritionists recommend an adult eat daily. That is similar to the protein in a 4-ounce serving of lean meat. But fish have fewer calories than other meats because fish have less fat. Fish oils are polyunsaturated and rich in vitamin D. Fish also supply vitamins and minerals. Fish are low in sodium, so if no salt is used in preparing fish, they are suitable for low sodium diets.



BUTTERFLY FILLET



FILLET

Land A Good Catch At The Market

Your local fresh fish dealer or supermarket can provide you with some tasty eating if you know how to land a good catch at the market.

The fresher the fish, the better the flavor. Look for these signs of freshness:

Fresh Fish

Flesh—firm and not separating from the bones. This indicates the flesh is fresh and has been carefully handled.

Odors—mild and fresh. Fish have a characteristic aquatic odor. It only becomes disagreeable as the fish loses freshness.

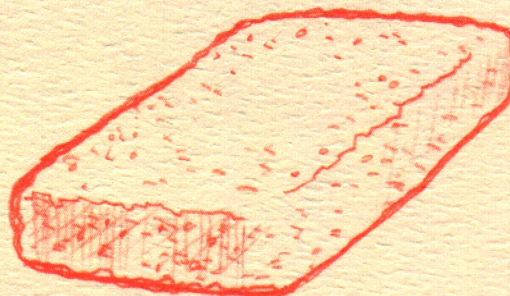
Eyes—bright, clear, and protruding.

Gills—red and free of slime.

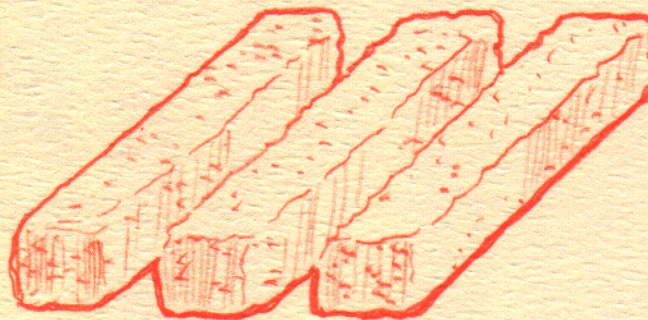
Skin—shiny and colorful. As the fish loses freshness, its characteristic markings fade.

Fresh Fillets and portions:

- flesh: firm, fresh cut look without traces of browning or drying
- odor: mild and fresh
- wrapping: moisture-vapor proof which covers fish tightly. Store fresh fish in covered container in the refrigerator and use within 2 days.



BREADED PORTIONS



BREADED STICKS

Retail Market Forms

Frozen Fish

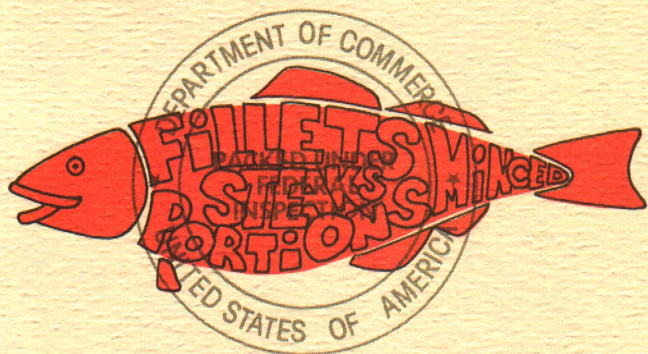
Frozen fish which have been kept solidly frozen and stored at 0°F or below can provide flavorful eating. Check for these things:

- Freezer case thermometer with 0°F reading or below
- Little or no odor
- Solidly frozen packages in moisture-vapor proof wrappings without air spaces or tears.
- Packages free of excessive frost or moisture
- Packages with no cottony or yellow or brownish tinges to fresh fish

Store frozen fish in freezer at 0°F or below. Use raw frozen fish within 3 to 6 months. Never refreeze thawed packages.

Inspection Seals

A federal inspection seal on a package is your guarantee that the fish was packaged under government supervision following standards for sanitation, wholesomeness and labeling.

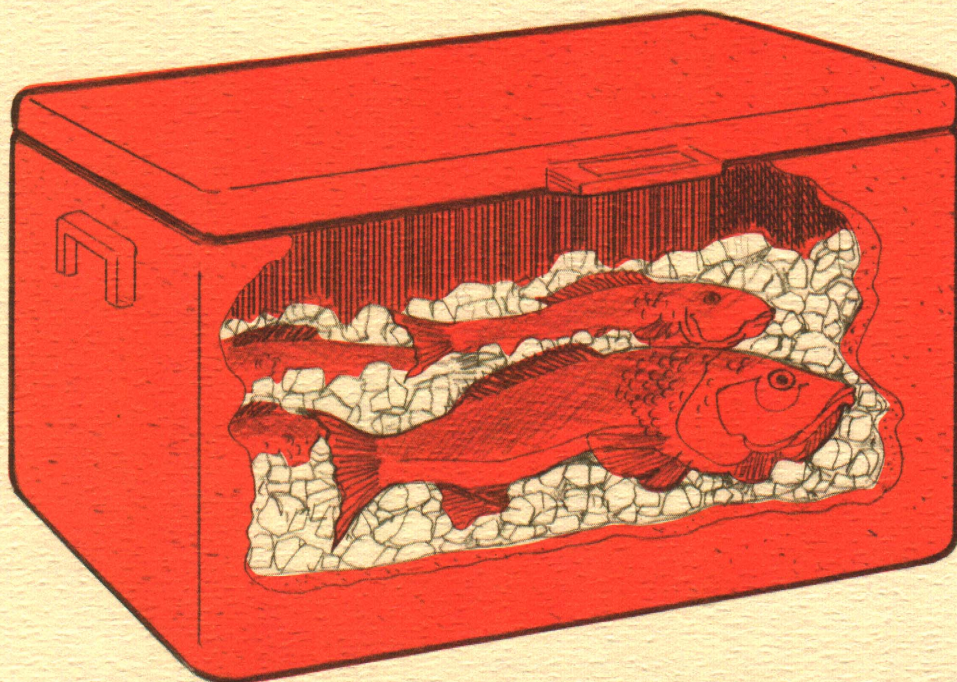


Your Catch

To make sure you eat your catch at its flavorful best, protect it. A stringer that keeps fish alive protects quality when fishing from a still boat. Always keep fish in a fly-proof container. Cold—especially refrigeration—best protects quality. An ice chest is essential. Pack fish in crushed ice immediately after removing them from the water. It is best to gut the fish first and pack ice in the body cavity as well as around the drawn fish, but whole or round fish can be successfully iced. Properly iced, fish can be held 2 to 3 days.

When stream fishing, a rigid creel that provides air circulation and protection from bumping, bruising, and crowding is preferable to a soft bag. Line your creel with soft moist sphagnum moss, ferns, grass or other greenery. Air circulation and evaporation keep fish cool.

The fish most apt to be damaged by how it is stored is smelt. The very weight of a full tub, pail or garbage can of fish is bound to crush those at the bottom of the container. Use shallow flat containers like those the commercial fishermen use and add ice to keep cold.

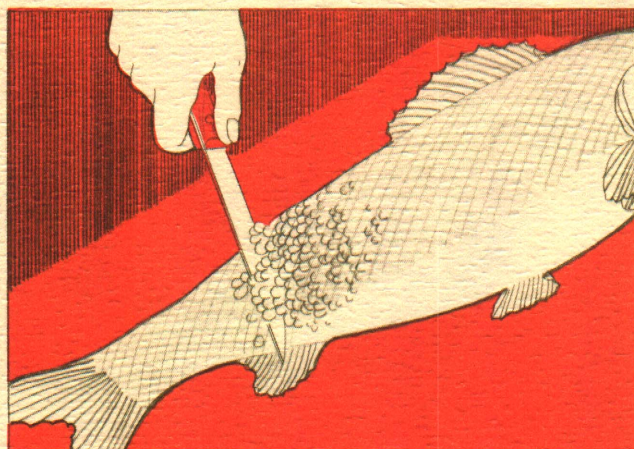


Cleaning and Dressing

Immediately upon getting your catch home or back to camp, clean and dress it. Remember to handle it gently; fish flesh is delicate.

The amount of cleaning depends on variety of fish and use intended. There are dozens of gadgets for cleaning fish. Usually a sharp knife and some practice will do the job.

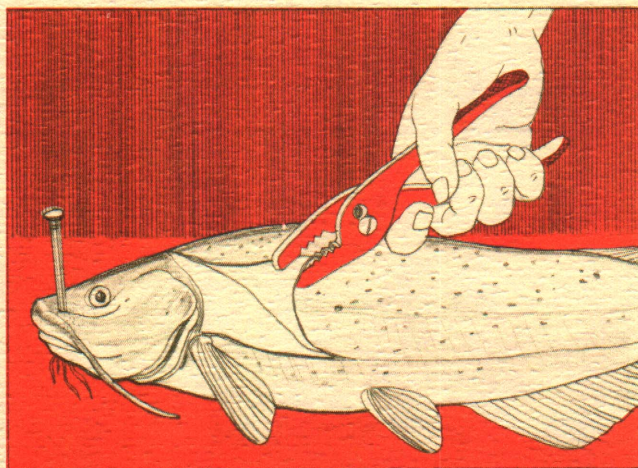
Fish, just as they come from the water, are whole or round fish.



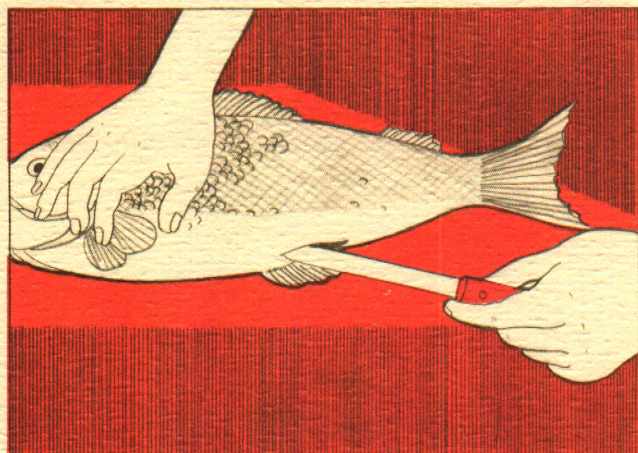
SLIME—Some species, like northern pike, have a thick mucous coating. A bath in vinegar solution (1 part vinegar and 3 parts water) will help remove it. Or, rub the fish with generous amounts of salt. Follow with a cold water rinse.

SCALES—Fish vary in number of scales and difficulty of removal. Trout have few scales to remove. Carp have scales which make a coat of armor and have to be "sawed" off or removed with the skin.

Generally fish are scaled by this method. Lay fish on the table. With one hand, hold the fish firmly by the head. Holding the knife almost vertical, scrape off the scales working from tail to head. A quick dip in boiling water will make scaling easier and also helps remove the slime layer.

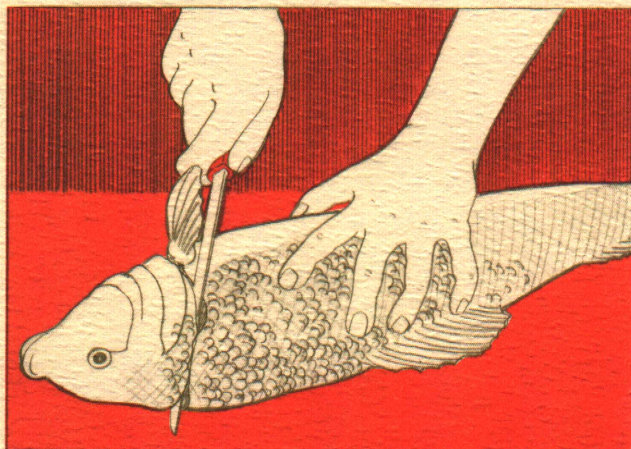


SKIN—The skin is removed from bullheads, catfish, burbot, and other fish. Hold the head firmly or nail it to a board. Slit the skin down the back and around the fins. Use pliers to pull off the skin. Pull from head to tail.



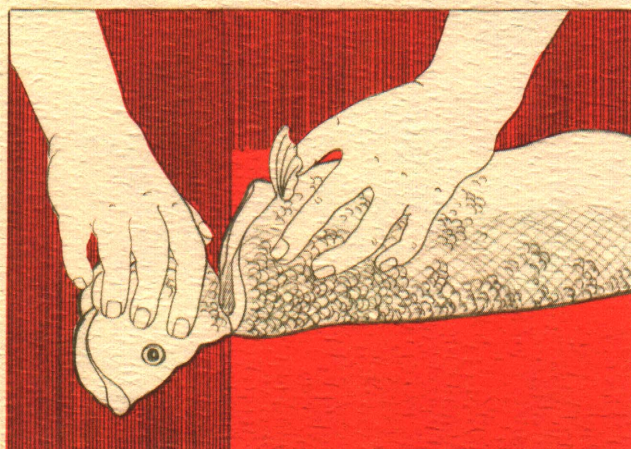
GUTTING—Fish with gills and viscera removed are *drawn* fish. Cut the entire length of the fish belly from vent to head and remove the viscera. Be sure to remove all dark material next to the backbone; this is the kidney. A stiff-bristled brush will help remove remains difficult to get with a knife. Then rinse thoroughly with clean water. (Save the fish liver. Though often no larger than the end of your thumb, fish livers can be tasty. Sauté them in butter or add them to scrambled eggs.)

HEAD—Fish is often cooked with the head on, especially with large fish. Then the gills must be removed. Insert tip of knife into gill cover and pull out gills and gill rackers. ➡

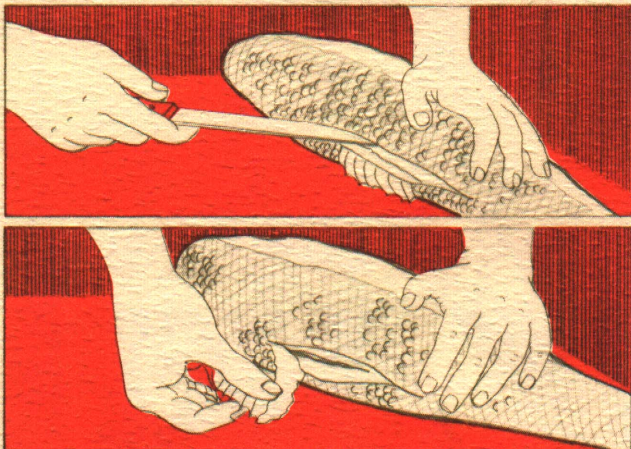


To remove the head, cut just above the collarbone behind the pectoral fins. If the backbone is large, cut down to it and then snap it over the edge of a table or cutting board. Cut any remaining flesh holding the head to the body. Remove the cheek meat from large fish.

CLEANING THE HEAD—The head can be useful for making stock and soups. Remove the gills and gill rackers and wash thoroughly. It is not necessary to remove the eyes. Don't forget the cheek meat. It is delicious. ➡



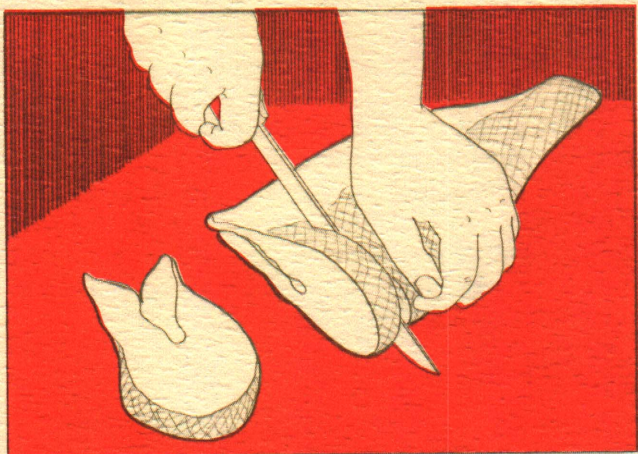
FINS—Remove the dorsal (large back) fin by cutting along both sides of the fin. Then give a quick pull toward the head and pull out the fin with the root bones attached. Remove other fins in the same way. If you merely trim the fins off with a knife, the bones at the base will be left in the fish. Cut off the tail. ➡



WASHING—The fish is now pan-dressed. Wash thoroughly in cold drinking-quality water. Store on ice or in the refrigerator.

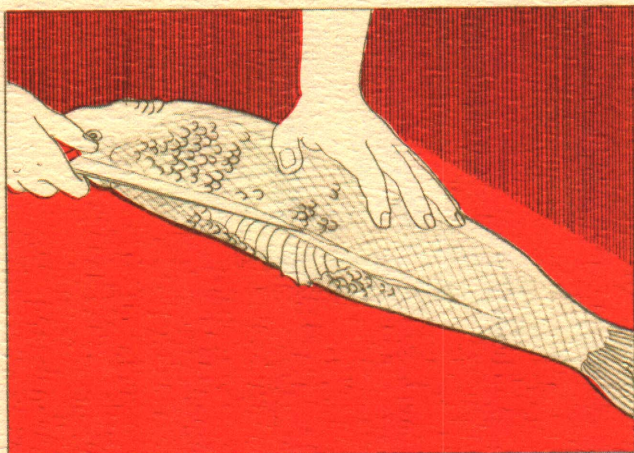
Cooking Forms

STEAKS. Fish can be cut into other forms. Large fish are often steaked. Cut crosswise, parallel to ribs. Make steaks about 1 inch thick.



Cutting steaks

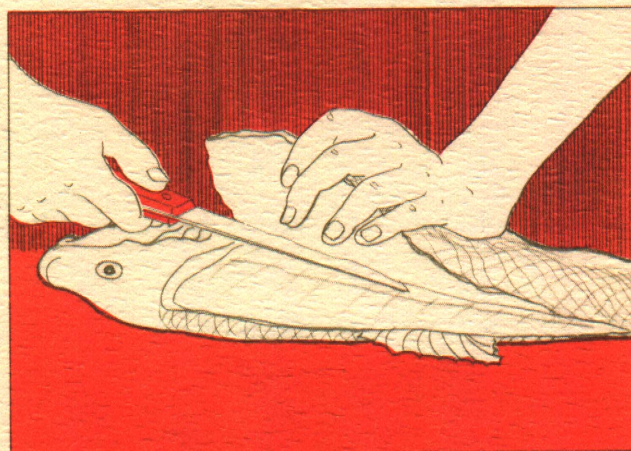
FILLETS. If you plan to fillet, it isn't necessary to gut the fish. Just fillet as described here, and remove fins and split into two pieces. To make butterfly fillets, you won't even split the fillets or cut through the belly.



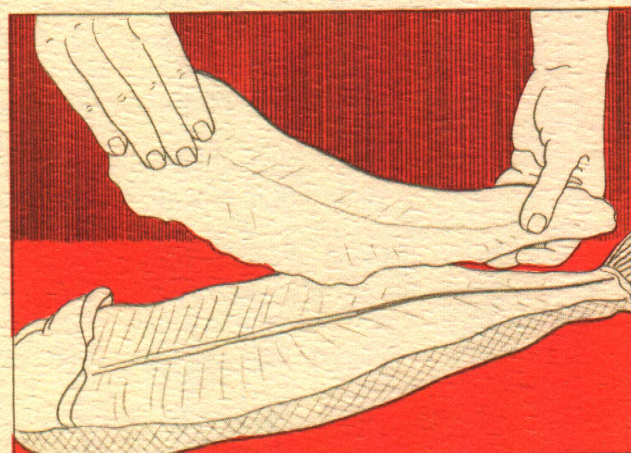
1. Start filleting by cutting along back.

Filleting requires a sharp, thin-bladed knife. Cut through the flesh along the back from tail to just behind the head. Then cut down to the backbone just above the collarbone. Turn the knife flat and cut the flesh along the backbone to the tail, allowing the knife to run over the rib bones. Lift off the entire side of the fish in one piece. Turn the fish over and repeat the operation on the other side. To skin a fillet, lay it on the cutting board skin-side down. Hold the tail end with your fingers and cut through the flesh to the skin. Flatten the knife on the skin and cut the flesh away, running the knife forward while holding the free end of skin firmly in your fingers.

Save bones, heads and skin to use in fish stock (p. 15).

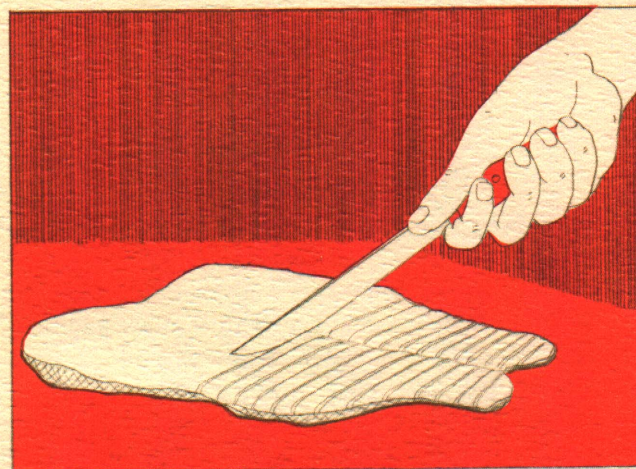


2. Cut flesh down to the backbone.



3. Lift off the side in one piece.

BONES. There are a number of ways to reduce bone problems. Canning fish softens bones so they are edible. Or you can grind them up in minced flesh. Fillet the bony fish like mullet (suckers). Put fillets through a meat grinder fitted with a fine blade. Use minced flesh in fish loaves, soups, casseroles and other dishes.



Cross-cut fillets to reduce size of small bones.

You can fry the bones crisp. Fillet the fish. Lay fillets on cutting board, skin-side down. Every $\frac{1}{8}$ to $\frac{1}{4}$ inch, cut crosswise through the fillet, but do not cut through the skin. Bread or batter the fillet and fry in a generous amount of oil.

You can remove the bones from cooked fillets. Cut along the solid lines in the drawing to remove the strips of Y bones.

Reducing Contaminants

Recently, many fish eaters have been concerned about contamination of large Great Lakes fish with PCBs, DDT and other industrial chemicals. Trout and salmon, especially the prized large fish, have been found to have more PCBs than is considered safe by the U.S. Food and Drug Administration. You can still use these large fish by following these suggestions. **Caution:** (However, eat no more than one meal a week of these fish. Pregnant or lactating women should avoid them entirely.)

Since these chemicals concentrate in the oil of the fish, how you clean and cook them can help you reduce your intake.

CLEANING—Fillet and skin the fish. Remove as much fat as possible. Remove fat deposits along the lateral line by cutting in a shallow V under the dark flesh. Trim fillet edge along the back fin and belly flap before cooking.

COOKING—Bake, broil or charcoal broil the fish to remove more fat from the flesh. Use a rack which will allow the oils to drain away. Do not use the drippings for anything, and do not pour them down the drain. Dispose of them with solid waste or they will end up in our lakes and streams again.

There is no guarantee that these procedures will reduce contamination to a "safe" level, but they will reduce the total amount consumed.

Mercury is a heavy metal and is distributed throughout the muscle tissue. It cannot be removed by cleaning or cooking. Lakes with unsafe levels of mercury in fish are usually posted.

Basic Fish Cookery

Cook fish promptly—Never keep raw fish longer than three days in the refrigerator.

Cooking frozen fish—You can cook fish quite successfully without thawing it first. Just allow additional cooking time for the frozen fish—about double the time in the recipe. But, recipes which call for stuffing, breading or broiling work better if the fish is thawed first. Thaw fish in its original wrappings in the refrigerator. Allow 16 to 18 hours per pound. For faster times—1 to 2 hours/lb.—thaw fish under *cold* running

water. Never allow fish to thaw at room temperature. Thaw fish only until it has just become pliable. It may still have some ice crystals in it. Never refreeze fish.

Cook to develop flavor—Fish flesh is very delicate and should be cooked only long enough to develop flavor. As a general rule, use low to moderate heat. Fish should be heated to an internal temperature of at least 180°F.

Overcooking is the most common mistake—Fish is done when white or cream-colored compared with the semi-transparent look of raw fish. It flakes easily when tested with a fork. If it falls apart by itself, it is overcooked. Properly cooked, it has a fine flavor and is moist, tender, and flaky. Overcooking makes fish tough, dry, and rubbery.

Serving Guides

Allow 3 to 4 ounces of cooked fish per serving. The chart shows how much fish of each form you would need. It is only a guide. You will need to vary serving size to suit the size of appetites in your family.

FORM	1 SERVING	4 SERVINGS
Dressed or pan-dressed	$\frac{1}{2}$ lb.	2 lbs.
Fillets or steaks	$\frac{1}{3}$ lb.	1- $\frac{1}{2}$ lbs.
Portions	2 portions	8 portions
Sticks	4 sticks	16 sticks
Canned	$\frac{1}{8}$ lb.	$\frac{1}{2}$ lb.

Substituting Fish in Recipes

Though cookbooks conventionally give recipes using ocean species, native fish from the Great Lakes also can be used with equal success in those recipes. Most recipes work equally well with any kind of fish. Two things to remember, however, when substituting one fish for another are size and fat content.

Size—Smaller fish cook faster than larger fish. For example, when substituting several smaller fillets for one large fillet, test for doneness early and often. Size is also related to fat content. Small fish of a species tend to have less fat than a larger fish of the same kind.

Fat content—Most white-fleshed fish have lean, mild meat. Dark-fleshed fish tend to be oilier and more strongly flavored. If you substitute fat for fat and lean for lean, you will not need to alter recipes. Lean fish may require more oil in the recipe or extra basting than a fatter fish cooked by the same method. Strongly flavored fish may require extra seasoning. A cooking method which reduces oil reduces strong flavors.

Lean fish include: alewife, bass, brook trout, bullheads, bluegills, burbot, carp, catfish, crappies, lake herring, northern pike, sucker, sunfish, walleye, and

yellow perch. Lean fish often seen in cookbook recipes are: cod, haddock, ocean perch, sole, turbot, and red snapper. Fat fish include: chubs, lake trout, rainbow trout, chinook salmon, and coho salmon.

Fish Cookery Methods

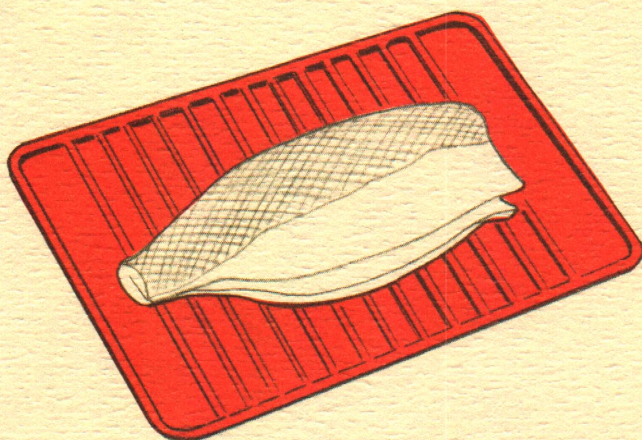
Broiling

Broiling renders oils out of the fish, so it is best used with fatty fish. Dressed fish, steaks, or fillets about 1 inch thick are suggested. Lean fish may require extra basting, or you can water broil them instead (see p. 11).

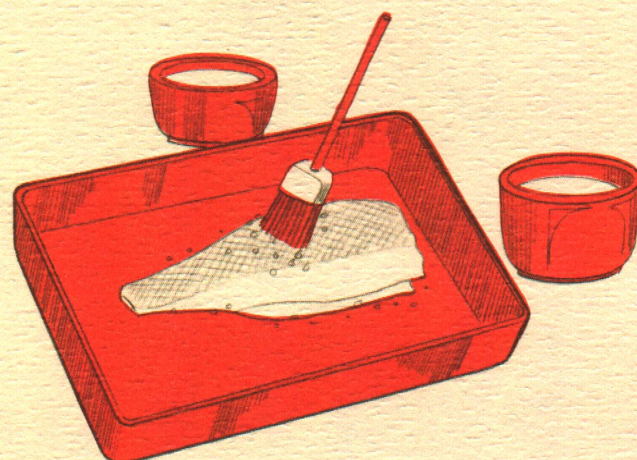
Method

1. Grease a shallow baking pan or broiler rack or cover with aluminum foil.
2. Preheat broiler.
3. Place fish on broiler pan and brush with melted butter, margarine or oil.
4. Salt and pepper the fish.
5. Place pan under the broiler so that the surface of fish is 3 to 4 inches from heat.
6. Cook until fish flakes with fork in thickest portion, usually about 10 minutes.
7. Serve sizzling hot.

Follow same procedure for pan-dressed fish except turn them once about half way through the cooking at 5 to 8 minutes.



BROILING



BAKING

Baking

Baking is one of the easiest ways to cook fish, though not always the quickest.

Method

1. Rub fish inside and out with salt.
2. Place fish in a greased baking pan.
3. Brush with melted fat, or lay slices of bacon over top.
4. Bake in a moderate oven (350°F) for 45 to 60 minutes or until fish flakes easily.
5. If fish seems dry during baking, brush occasionally with drippings or melted fat, or baste with sauce.
6. Serve immediately on a hot platter, plain or with a sauce.

Dressed baked fish is excellent stuffed. Use rice, bread, or herb stuffing. Fillets or steaks may be baked by the same procedure. Reduce the time to 20 to 25 minutes.

See "Cooking in Liquid" for baking fish in sauces.

No-Stick Tricks

To prevent fish sticking to pan, make a bed of celery tops or other vegetables. Lay fish on the vegetable bed. Coat cold pan with fat. Sprinkle it with corn meal. Lay fish in pan and cook.

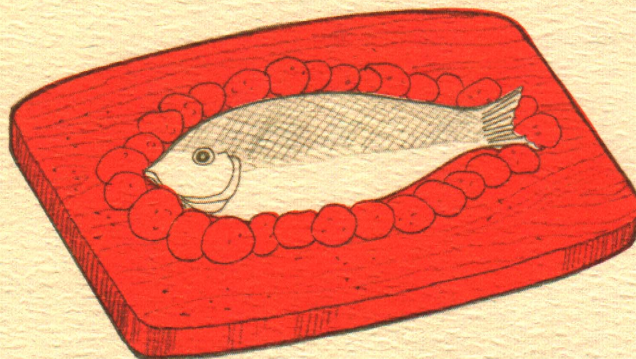
Fish is usually more moist if head and tail of whole fish are left on for baking.

Planking

This is how a fish is often served in restaurants. No extra serving dishes are needed. Simply cook the fish on the serving dish.

Method

1. Clean, wash and dry fish.
2. Sprinkle fish inside with salt and pepper.
3. Place on a preheated, oiled plank or well-greased bake-and-serve platter.
4. Brush fish with melted fat or oil.
5. Bake in a moderate oven (350°F) for 45 to 60 minutes or until fish flakes easily when tested with a fork.
6. Serve with mashed potatoes and vegetables arranged on plank or platter.



PLANKED

Pan-dressed fish will require only 25 to 30 minutes. Fillets and steaks can also be planked. Reduce cooking time to 20 to 25 minutes.

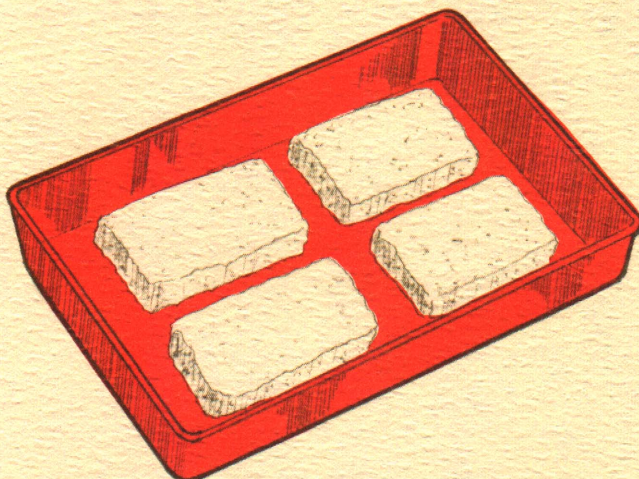


Frying

Frying methods all use oil for a crispy surface for the fish. It is very important to have hot, but not smoking, oil. Heating the oil until it smokes will give the fish off-flavors. Fish should be fried in hot fat at 350° to 375°F.



PAN FRYING



OVER FRYING [PORTIONS]

Pan Fry

1. Cut fish into servings if too large to fry whole.
2. Coat with flour and seasonings or other coating mixture. (See "Batter and Breadings.")
3. Place fish in a heavy frying pan with about ⅛ inch melted fat, hot but not smoking.
4. Keep fat hot but not smoking.
5. When fish is brown on one side, turn carefully and brown the other.
6. Cooking takes about 5 minutes on each side, depending on the thickness of the fish.
7. Drain on absorbent paper.
8. Serve immediately on a hot platter, plain or with sauce.

Oven Fry

1. Preheat oven to 500°F.
2. Cut fish into serving-size portions.
3. Dip in salted milk, and coat in crumbs.
4. Grease a shallow baking pan.
5. Place fish in pan, and pour a little melted butter, margarine or oil over fish.
6. Cook 10 to 15 minutes or until fish flake easily.

Oven frying requires little time and no careful watching. The high temperatures and crumb coating keep fish moist and give it an attractive brown crust.

Deep Fat Fry

1. Cut fish into servings.
2. Dip in batter or coating mixture.
3. Fill a deep kettle with enough fat to cover the fish, but no more than half full.

4. Heat the fat to 350°F.
5. Place a layer of fish in the frying basket.
6. Cook to an even golden brown, about 3 to 5 minutes.

7. Raise basket, remove fish and drain on absorbent paper.
8. Serve immediately, plain or with sauce.



Steaming

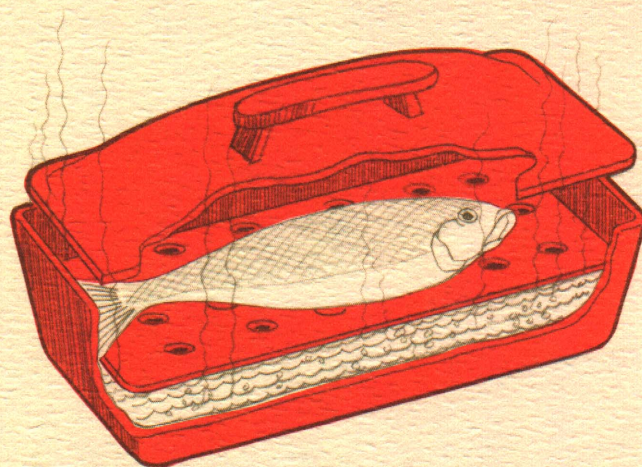
This is a good way to prepare fish for persons on restricted diets, and to cook fish for cooked fish dishes.

Stove-Top Steaming

1. Sprinkle fish with salt and pepper.
2. Bring liquid ("See Liquids for Cookery") to boil in a deep pan.
3. Place fish on rack over boiling water.
4. Cover pan.
5. Steam 5 to 10 minutes.

Oven-Steamer

1. Wipe fish with damp cloth and season with salt and pepper.
2. Measure thickness of fish.
3. Wrap fish tightly in an envelope of greased aluminum foil. Double fold and pinch ends to make foil steam tight.



STEAMING

4. Place on baking sheet in moderate oven (350°F).
5. Allow 10 minutes per inch of thickness for fresh fish and 20 minutes per inch for frozen fish.

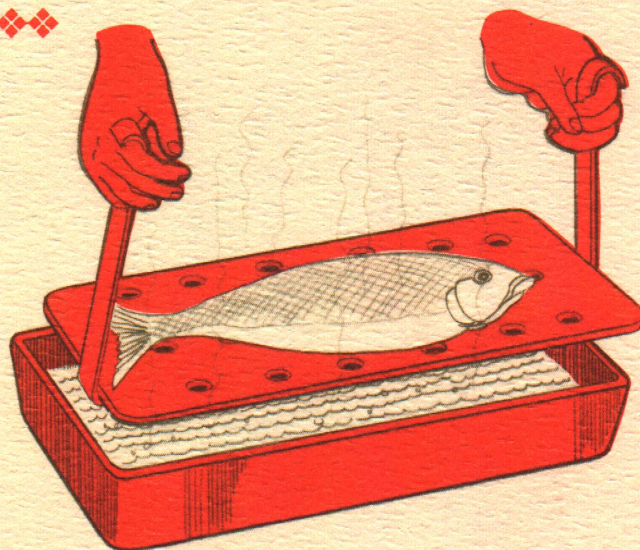


Water Broiling

This method is ideal for lean fish. It combines the moistness of steaming with the desirable appearance of broiling.

Method

1. Preheat broiler pan with oven.
2. Bring water or other steaming liquid (See "Liquids for Cookery") to a boil.
3. Remove rack from pan. Pour liquid into lower portion of pan, to at least ¼ inch deep. Make sure some space remains between liquid and broiler rack.
4. Grease rack lightly.
5. Place fish on rack. If desired, cover with topping or dot with butter.
6. Return pan to oven, about 3 to 4 inches from heat. Broil fish about 8 minutes. Check early to see if it's done. If top browns before fish flakes easily, turn off broiler and let the steam finish the cooking.



WATER BROILING

Thin fillets or steaks (about ¾ inch) work better than thick pieces. Use water, lemon juice and water, wine, court bouillon or any other liquid that produces adequate steam.

Fish Cooking Guide

COOKING METHOD	FORM	AMOUNT FOR FOUR	TEMPERATURE (F)	TIME IN MINUTES
Baking & Planking	<i>dressed</i>	2 lbs.	350°F.	45 to 60
	<i>pan-dressed</i>	2 lbs.	350°F.	25 to 30
	<i>fillets or steaks</i>	1½ lbs.	350°F.	20 to 25
	<i>frozen breaded portions</i>	8 portions	400°F.	15 to 20
	<i>frozen fried sticks</i>	16 sticks	400°F.	15 to 20
Broiling	<i>dressed</i>	2 lbs.	broil 3 to 4 inches from heat	10 to 16 (turn once)
	<i>pan-dressed</i>	2 lbs.		10 to 16 (turn once)
	<i>fillets or steaks</i>	1½ lbs.		10 to 15
	<i>portions and sticks</i>	8 and 16		10 to 15
Water Broiling	<i>thin fillets or steaks</i>	1½ lbs.	same as broil	6 to 10
Charcoal Broiling	<i>dressed (foil-wrapped)</i>	2 lbs.	burned-down coals 3 to 4 inches from heat	30 to 40 (turn)
	<i>pan-dressed</i>	2 lbs.		30 to 40 (turn)
	<i>fillets or steaks</i>	1½ lbs.		10 to 20 (turn once)
Poaching	<i>fillets or steaks</i>	1½ lbs.	simmer	5 to 10
Steaming	<i>fillets or steaks</i>	1½ lbs.	boil	5 to 10
Oven Frying	<i>pan-dressed</i>	2 lbs.	500°F.	15 to 20
	<i>fillets or steaks</i>	1½ lbs.	500°F.	10 to 15
Pan Frying	<i>pan-dressed</i>	2 lbs.	moderate	8 to 10 (turn once)
	<i>fillets or steaks</i>	1½ lbs.		
	<i>breaded, fried portions</i>	8		
	<i>breaded, fried sticks</i>	16		
Deep Fat Frying	<i>pan-dressed</i>	2 lbs.	350°F.	3 to 5
	<i>fillets or steaks</i>	1½ lbs.		
	<i>raw breaded portions</i>	8		

Cooking Fish in Liquid

Liquid cooking is especially good for lean fish. Retain cooking liquids for sauces and soups.

Poaching

1. Place fish in saucepan. Put fish in a basket or cheesecloth for easy handling.
 2. Barely cover with liquid (See "Liquid for Fish Cookery").
 3. Simmer—do not boil—5 to 10 minutes or until fish flakes easily.
 4. Remove and serve, or flake for use in other dishes.
- Burbot (lawyers) is good cut into strips and poached and then eaten like lobster dipped in melted butter.

In Sauces—Stove-Top

1. Place fish in frying pan.
2. Cover with sauce.
3. Simmer 10 minutes or until fish flakes easily.



POACHING

In Sauces—Oven

1. Place fillet in baking dish in single layer.
2. Cover with sauce.
3. Place in moderate oven (350°F).
4. Cook about 20 minutes or until fish flakes with fork. Double the time for frozen fish.

Add An Outdoor Flavor

Fish tastes especially good when cooked while camping. Add an outdoor flavor at home by cooking fish on a charcoal grill, but never use a grill indoors. Always cook fish over burned-down coals. Fish cook quickly and are naturally tender, so they are well suited to outdoor cookery. (And outdoor cooking also means no kitchen odors.)

Fillets or Steaks

1. Place fish on one half of wire grill.
2. Baste with butter or sauce.
3. Close grill and place about 4 inches above coals.
4. Broil 10 to 20 minutes, turning fish once.

Fish sticks to the grill and is apt to fall apart when you try to turn it. To avoid this problem, use a long-handled, mesh basket or hinged grill, or encase the fish in aluminum foil, or spread foil over the regular grill and lay fish on the foil. To let oils drain away, pierce the foil in several places.

Thick cuts dry out less readily than thin cuts.

Dressed Fish

1. Wrap a 2 lb. to 3 lb. dressed fish in aluminum foil.
2. Place it on the grill.
3. Cook slowly 30 to 40 minutes, turning fish occasionally.

Brine-Basted Barbecued Whitefish

This method is an adaptation of whitefish-on-a stick, an outdoor cook-your-own method, popular in the Copper Country of Michigan's Upper Peninsula. Make a bed of hardwood or charcoal coals. Make brine from 1 cup of salt to each gallon of water. Provide enough buckets of brine so that one is readily available to each cook. Cut whitefish into fillets or serving-size steaks. Provide each person with a basket or fork to hold fish securely. A peeled, forked green stick can be used, but be sure to weave fish on the stick so it does not fall off. Cook whitefish over hot coals until it starts to sizzle and brown. Then dunk fish into brine and repeat until fish is completely cooked. This is an excellent way to involve everyone in the cooking. Complement your outdoor meal with vegetable, salad, bread and dessert.

A Fish Boil

A fish boil is fun for 4 people or 40. In Scandinavian countries, dried or salted fish is freshened by boiling it with potatoes. If you have no Scandinavian neighbors to teach you the process, follow these directions.

Ingredients—You will need: fresh fish (fillets, steaks or whole) in serving-size pieces, potatoes, onions, salt and butter. Amounts depend upon number to be served. Usually portion sizes of one pound of fish per person when only men are dining, or one-half pound per person for mixed groups are sufficient.

Cooking—Fish boils are easy to prepare in the kitchen and are fun outdoors over an open fire. The easiest method uses a roomy kettle with two baskets. Bring water to a rolling boil. Add salt ($\frac{1}{2}$ cup per gallon) to the water.

In the first basket, lower peeled potatoes into the water and cook approximately 12 minutes. Then add whole peeled onions to the potato basket. Use 1 onion and 2 medium-sized potatoes for each person. Cook another 5 minutes.

Next, fill the second basket with fish steaks and fillets. Add another $\frac{1}{2}$ cup salt per gallon of water. Lower

basket into boiling water and cook fish for about 12 minutes.

If you are cooking on the kitchen stove, skim off the scum which forms on the liquid. Outdoors, increase the heat of the fire until the kettle boils over. This will remove the scum and put out the fire.

Lift out the baskets of fish, potatoes and onions. Serve on platters with butter.

For a kitchen fish boil, it is possible to use one basket. Cook potatoes and onions loose in kettle. Add the fish in the basket. When cooked, lift out the fish and drain the vegetables.

Breadings, Broiler Toppings, and Batters

Breadings and toppings add flavor and texture.

Breading

To coat fish evenly, first dry pieces with paper towel. Put breading into paper or plastic bag. Add fish, and shake until uniformly coated. Some cooks prefer to dip pieces in milk, beaten egg or water and then coat in breading mix. Coat fragile pieces in dishes rather than jostling them in a bag. Good breading ingredients are: flour, cornmeal, cracker, bread or cereal crumbs, or any combination of these ingredients. Good seasonings for breading range from simple salt and pepper to herbs and grated cheese.

Broiler Toppings

Add broiler toppings just before you place the fish under the broiler. Any of the breading ingredients mentioned above can be sprinkled on fish to be broiled. Drizzle melted butter, margarine or other oil over the dry ingredients. Paprika gives broiled fish an appealing appearance. More exotic toppings include chopped nuts, grated coconut and peanut butter. Try vegetable and cheese toppings also.

Batters

Batters are usually used to coat fish for deep fat frying. Batters rich in egg yolk resist fat penetration. Here is one recipe.

BASIC FRYING BATTER FOR FISH

$\frac{1}{4}$ c. flour	1 egg, beaten
1 T. sugar	1 c. liquid (water, flat beer, milk)
1 t. dry mustard	Vegetable oil for deep
$\frac{1}{4}$ t. cayenne pepper or other spices	fat frying
2 t. baking powder	$\frac{1}{2}$ t. salt

Stir together dry ingredients. Carefully combine egg and liquid. Slowly stir into the flour mixture. Dip fish in batter, and pan fry a few at a time in hot oil (400°F to 425°F) about 3 minutes or until golden brown. Enough batter for 3 pounds of skinless fillets cut into squares or serving-size pieces.

HUSH PUPPIES

(A favorite Southern side dish for fish)

$\frac{3}{4}$ c. cornmeal	3 large eggs, beaten
$\frac{1}{4}$ c. flour	$1\frac{1}{4}$ c. milk
2 T. baking powder	$\frac{3}{4}$ c. finely chopped onion
2 t. salt	$\frac{1}{2}$ c. melted fat or oil
$\frac{3}{4}$ t. pepper	

Mix dry ingredients. Combine eggs, milk, onions and fat. Add to dry ingredients and stir only until blended. Fry by tablespoonfuls in deep fat at 350°F until browned, about 3 to 4 minutes. Drain on absorbent paper. Makes 50.

Liquids for Fish Cookery

Any of these liquids can be used to improve the flavor of fish when poaching, steaming or water broiling.

Acid water—To each quart of water, add $1\frac{1}{2}$ T. of salt and 3 T. of lemon juice or vinegar.

Fish stock—To each quart of cold water, add 1 pound of fish trimmings (head, bones, skin, and tails) and $1\frac{1}{2}$ T. of salt, bring to a boil and simmer for 30 minutes. Strain.

COURT BOUILLON

$\frac{1}{2}$ c. diced carrots	2 qt. water
$\frac{1}{2}$ c. chopped onion	6 whole black peppers
$\frac{1}{2}$ c. chopped celery	2 whole cloves
2 sprigs parsley	1 bay leaf
2 T. melted butter or other fat	2 T. salt
	2 T. vinegar

Cook the vegetables in fat about 5 minutes to brown slightly. Add water, spices (tied in a bag) and vinegar; simmer 30 minutes. Strain.

Seasonings and Sauces

Seasoning Fish

Most fish are delicately flavored and delicious. Salt and a little butter, cream or lemon juice are all the seasoning necessary for whitefish, perch, burbot and bluegills.

Sauces used with these fish include mushroom, almandine, hollandaise, mild cheese sauces and white wine. Other fish are enhanced by more intensely flavored sauces and seasonings. Carp, catfish, mullet and salmon are good with tomato, mustard, vinaigrette, horseradish, creole and barbecue sauces.

Herbs and Spices

Good seasonings for fish include: basil, bay leaves, celery salt, chervil, chives, dill, cinnamon, nutmeg, cayenne powder, garlic, fennel, curry, oregano, paprika, marjoram, rosemary, thyme, parsley, tarragon and saffron.

Sauces

Most cooks baste with butter or margarine and lemon juice. Other sauces can be used as a marinade for soaking fish several hours before cooking and for basting during cooking. Or heat the sauces and pour over cooked fish.

Mild Sauces

BUTTER BASED

To $\frac{1}{4}$ c. butter (or margarine) add:
1 T. lemon juice and $\frac{1}{4}$ c. blanched, slivered almonds
OR 1 T. lemon juice and 1 T. minced parsley
OR 1 T. lemon juice and 1 T. sesame seed
Use as marinade, basting, or serving sauce.

CREAM SAUCE AND VARIATIONS

To $\frac{1}{2}$ c. sweet cream, or $\frac{1}{2}$ c. dairy sour cream, or $\frac{1}{2}$ c. canned milk, or $\frac{1}{2}$ c. cream sauce add:
1 T. lemon juice
OR 2 T. dry white wine
OR 2 T. horseradish
OR $1\frac{1}{2}$ T. prepared mustard
OR 1 T. lemon juice (or vinegar) and $\frac{1}{2}$ c. chopped cucumber
Use as marinade, basting or serving sauce.

Tangy Sauces

SWEET AND SOUR SAUCE

1 can (8 oz.) tomato sauce	$\frac{1}{2}$ t. paprika
$\frac{3}{4}$ c. white wine vinegar	$\frac{1}{8}$ t. allspice
$\frac{3}{4}$ c. water	2 T. cornstarch
$\frac{3}{4}$ c. sugar	$\frac{1}{4}$ c. water
1 t. salt	

Mix tomato, vinegar, salt and $\frac{3}{4}$ c. water and bring to a boil. Dissolve cornstarch in $\frac{1}{4}$ c. water. Add to sauce; cook and stir until thickened. Blend in paprika and allspice. Pour over cooked fish, or stir into fried fish portions. Simmer and serve.

VINAIGRETTE SAUCE

3 T. vinegar or dry white wine	1 T. chopped green pepper
$\frac{1}{4}$ c. oil (olive or salad)	1 T. chopped onion
1 t. salt	1 T. chopped sweet pickle or
$\frac{1}{4}$ t. paprika	drained pickle relish

Mix ingredients. Use as marinade.

These acid sauces help reduce the odor of cooked fish.

Fish Soups

SOUP STOCK (for soups, gravies or stews)

Method 1

1. Cover bones, heads, skin and tails with water.
2. Add onions, celery tops, salt and pepper.
3. Simmer at least 2 hours.
4. Strain through a fine sieve and refrigerate. Use within 7 days.

Method 2

1. Steam fish and remove bones.
2. Add flaked fish to liquid to form stock.
3. Simmer at least 2 hours.
4. Refrigerate finished stock. Use within 7 days.

CLEAR BROTH SOUP

Use one of the stock recipes discussed or make broth by simmering onions, celery leaves, and diced potatoes in water until potatoes are

tender. Add fish and salt or other desired seasoning for the last 10 to 15 minutes.

MANHATTAN CHOWDER

1 lb. fish	1 c. peas
4 slices bacon	1 c. corn
2 c. water	1 t. salt
1 c. diced potatoes	$\frac{1}{4}$ t. pepper
$\frac{1}{2}$ c. diced carrots	$\frac{1}{4}$ t. thyme
$\frac{1}{2}$ c. chopped celery	1 T. Worcestershire sauce
$\frac{1}{2}$ c. chopped onions	1 lb. can tomatoes

Poach and debone fish. Save poaching liquid. Fry bacon. Cook onions in bacon for about 10 minutes. Mix vegetables, seasonings, bacon and tomatoes together in large pan. Add poaching liquid and extra water if necessary to make 2 cups liquid. Simmer for 45 minutes or until vegetables are soft. Add fish and simmer 5 more minutes. Makes 6 servings.

NEW ENGLAND (milk based) CHOWDER

1 lb. fish	4 T. flour
4 strips bacon	1 c. chopped onions
2 c. diced raw potatoes	3 c. milk
1 t. salt	

Steam and debone fish. Cover diced potatoes with 1 cup salted water.

Simmer 10 minutes. Add fish and cook 15 minutes. Fry bacon until crisp. Add onions and cook slowly 10 minutes. Add flour to onions and bacon and stir until smooth. Add 3 c. canned milk, milk or diluted half and half to make a cream sauce. Cook until thickened. Add sauce to fish and potatoes. Simmer 5 minutes. Makes 6 servings.

Use Cooked Fish

Cooked fish should be stored in the refrigerator in a covered container for no more than 3 days. Cooked fish can be frozen for no more than 3 months. Use cooked fish in fish loaves, casseroles, croquettes, creamed dishes, salads, sandwich spreads, and any other imaginative way. Native species can be used the way commercially canned salmon or tuna are used. Here is an unusual way to use cooked fish.

FISH BAKED IN BREAD

Bread dough	2 T. butter
1 c. cooked, flaked fish	Salt and pepper

Roll bread dough which is ready for the oven into a thin (½ inch thick) round. Place cooked fish on one half. Season to taste with salt, pepper and butter. Turn other half of dough over the fish and crimp edges. Let rise until it doubles in volume. Bake at 400°F for first 10 minutes, then reduce heat to 325°F. Cook an additional 30 minutes or so until loaf is done. It should sound hollow when tapped with your knuckle.

Boneless flesh is easiest to remove from a skeleton after cooking. First remove the fins. Then work flesh loose along the backbone. Work from head to tail. Lift the meat off top of fish by pulling away from the rib cage. Then grasp the bony skeleton near the head and peel away from remaining meat.

Fresh Roe

Roe (fish eggs) is a very versatile food. It is smoked, made into caviar, and added to many dishes. It is even used as bait to catch more fish. The roe of most sport fishes is used after cleaning. The simplest way to cook roe is to clean it and batter it like the fish flesh, and then cook it with the fish.

Parboiled Roe

To clean roe remove all bits of viscera and connective tissue. Wash gently, but thoroughly, in cold water. Tie eggs in a cheesecloth bag and place in boiling water to cover. To each quart of water used, add 1 tablespoon salt and 1 tablespoon vinegar. Reduce heat and simmer roe for 15 to 20 minutes. Drain, cool and again check to remove any bits of skin, etc. Store parboiled roe in a covered container in refrigerator. Use within 2 days.

Roe in Scrambled Eggs

Mince and saute onions in butter or margarine until onions are translucent. Add beaten eggs and parboiled roe, salt and pepper; scramble. The amount of roe combined with the (chicken) eggs may vary from just enough to flavor the eggs to equal amounts.

Roe and Cooked Fish in Cream Sauce

Any leftover cooked fish can be flaked and combined with equal parts of parboiled roe, some hard-cooked egg plus salt and pepper to taste. Add to a cream sauce. Serve over toast, rice or potatoes.

ROE PATTIES

2 c. parboiled roe	1 T. minced onion
1 c. thick white sauce	1 beaten egg
1 t. salt	Fine, dry bread crumbs
¼ t. pepper	

Combine roe, white sauce seasonings and egg. Add enough bread crumbs to give mixture a stiff enough texture to form into patties. Fry in bacon fat, butter or margarine over low heat. Brown on both sides.

To make caviar or bait from roe, consult Extension Bulletin E-960, *Salmon Eggs: Bait and Food*, MSU Cooperative Extension Service and Sea Grant Advisory Services. It is available from your County Extension Office.

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