

October 12, 2000

Moderator's Guide for Methylmercury Risk Communication Focus groups.

Thank you for participating in this focus group today. I'll be leading you in a discussion about how consumers should be informed about health risks.

Before we start, let's go around the room and introduce ourselves. Tells us your first name and something about your household—how many people in your household, any children?

General Groups: Also, is anyone you know expecting a child in the next few months? As far as you know, what is she doing to get information about the risks of pregnancy?

Pregnant Women: Where do you look for information about the risks of pregnancy?

FISH CONSUMPTION QUESTIONS:

How many of you eat fish or seafood of any kind? What do you eat? How often? If don't eat, why? What are the advantages of eating fish? Disadvantages?

I. Consumer Priors

Let's talk first about possible environmental contaminants that can get into the air we breathe the water we drink or in the foods we eat, things like mercury or lead or pesticides.

First of all, have you heard about any of these contaminants? What have you heard? How are the risks from these kinds of substances similar or different from other kinds of problems such as industrial pollution, toxic spills, or food poisoning?

Where do you think you are most likely to be exposed to mercury/to pesticides?

Are you doing anything in particular now to protect yourself from these sorts of environmental contaminants? What are you doing?

What kinds of precautions should be taken to industry and by government to reduce the risk of consumer exposure to these kinds of contaminants?

What should consumers do? Why do you say that?

OMIT SECTION IN BRACKETS?

[Do you see any difference between accidental exposure, where people are exposed to high levels of a contaminant because of an accident or natural disaster, and chronic exposure, where people are exposed to low levels of the contaminant by virtue of their lifestyle choices, e.g., what they eat, or where they work or live?

Are these different kinds of threat or are they the same?

What should industry, the government and public health officials, be doing to inform you about your risk of chronic and accidental exposure to these kinds of substances?

Should they have a different role with respect to chronic exposure compared to accidental exposure? What should their role be in each case?]

What kind of information do you as a consumer need to protect yourself from exposure to these kinds of environmental contaminants? Is it the same for accidental vs. chronic exposure? Who should provide the information and how should it be provided?

GROUP 1: GO TO NEXT SECTION (INTRODUCTIONS)

II. NATIONAL ACADEMY OF SCIENCE Information Piece

Let's talk now specifically about mercury. How much of a problem is mercury contamination. How does it compare to pesticides for example? How are people exposed to mercury?

Has anyone heard about the recent National Academy of Sciences report on mercury?
Here are some excerpts from the report:

NAS Synopsis

Mercury is widespread and persistent in the environment. Its use in many products and its emission from combustion processes has resulted in worldwide, chronic, low-level environmental exposures. Consumption of contaminated fish is the major source of human exposure to mercury in the United States. The developing nervous system is particularly sensitive to the negative effects of low-dose mercury exposure. The population at highest risk is the children of women who consume large amounts of fish and seafood during pregnancy. The risk to that population is likely to result in an increase in the number of children who have to struggle to keep up in school and who might require remedial classes. Because of the beneficial effects of fish consumption, the long-term goal needs to be a reduction in the concentrations of mercury in fish rather than a replacement of fish in the diet by other foods. In the interim, the best method of maintaining fish consumption and minimizing mercury exposure is the consumption of fish known to have lower mercury concentrations.

What is new/interesting about this information? What is most important/surprising about this information?

Assume that your job was to talk to a pregnant woman about the hazards of mercury. Based on what you just heard, what is the most important thing for her to know?

II. Possible Messages

A. Introductions

Now let's look at some examples of information about the hazards of mercury in food that might be provided to consumers, either in the form of booklets, on the internet, or in a news story. Here are some examples of introductory information that could be found in a longer message piece that would probably be followed by more specific advice.

Example 1: Warning: Mercury in fish may harm the babies of pregnant and nursing mothers, and young children.

Example 2: Small amounts of mercury can harm a brain starting to form or grow. That is why unborn and nursing babies and young children are most at risk. Too much mercury can affect behavior and learning. Mercury can harm older children and adults but it takes larger amounts. It may cause numbness in hands and feet or changes in vision.

Example 3: A recent report from the National Academy of Sciences looked at the evidence that mercury can cause learning problems in children exposed to high levels of mercury in the mother's diet during pregnancy. Since fish are the main source of dietary exposure to mercury, the EPA and FDA are providing guidelines about the kinds and amount of fish that pregnant and nursing mothers and women of childbearing age can safely eat without exposing their children to any significant risk of harm.

Example 4: Seafood is an important and growing part of the American diet. Seafood provides significant nutritional benefits to consumers. Some seafood, particularly large ocean fish and freshwater fish caught in contaminated waters, may contain levels of mercury that pose a risk to babies of pregnant and nursing

mothers. The FDA and EPA advise women who are pregnant or may become pregnant within six months or are nursing mothers to follow the safe eating guidelines outline below. This advice should not be taken as a need to abstain from consuming seafood except as indicated.

Example 5: Fish is an important source of high quality protein, vitamins and minerals. Certain fish species, however, are known to contain higher levels of mercury than others do. Pregnant women and women of childbearing age are advised to eat a variety of seafood and to avoid eating those species that may contain higher levels of mercury. These species are listed below.

What does this example say to you?

Does it do a good job at describing the hazard from mercury?

Will this kind of introduction help you understand who should pay attention to the following advice and why?

Do you find anything about this introduction to be confusing?

Is there any important information that is missing from this introduction?

B. Safe-Eating Guidelines

Now let's look at some examples of specific advice that might be provided to consumers, particularly pregnant women and women who might become pregnant, about what they can do to reduce the risk of exposure to mercury.

USE NEW ORDER:

1. REVISED FDA EXAMPLE
2. EPA EXAMPLE
3. NMF EXAMPLE
4. MAINE REVISED EXAMPLE (NO GRAPHICS)

[Example 1: State of Maine's Safe Eating Guidelines

Example 2: FDA Advice (version 1)

Example 3: EPA's 10-4 Guidelines: What Kinds of Fish Should I Eat.

Example 4: NMF Fish Safe Eating Guidelines

Example 5: FDA Advice (version 2)

Example 6: Cooking Tips] DO WE WANT TO USE THE TIPS AGAIN?

How would you describe the main message of this consumer advice?

What is the most important point you take from this consumer advice?

Does this information piece do a good job at explaining who should be worried about mercury? Explain.

What is distinctive about this approach?

How clearly are the risky kinds of fish specified?

How well does this advice work for pregnant women?

How will other people understand and use this advice?

TUNA: What do you think about the advice about canned tuna? Will it change what you do?

How will pregnant women factor this kind of advice into everything else they are concerned about with respect to the health of their baby.

How will other people factor this advice into their dietary choices?

If they say they would stop eating fish, ask all types of fish or just ones shown in the handouts as high?

What would you eat instead?

FOR EPA EXAMPLE: CLARIFY—WHAT IS TABLE 1 TELLING YOU? WHAT ABOUT TYPES OF FISH THAT AREN'T IN EITHER TABLE 1 OR TABLE 2? (I.E., HOW MANY CATEGORIES OF FISH ARE COVERED IN THIS INFORMATION?)

WHAT DOES MODERATION MEAN, WITH RESPECT TO FISH CONSUMPTION?

IS IT IMPORTANT FOR CONSUMERS TO EAT FISH? EXPLAIN.

Based on our discussions tonight, what do you think are the most critical pieces of information that should be provided to consumers? Who should get this information?

National Academy of Science Report Summary

Mercury is widespread and persistent in the environment. Its use in many products and its emission from combustion processes has resulted in worldwide, chronic, low-level environmental exposures. Consumption of contaminated fish is the major source of human exposure to mercury in the

United States. The developing nervous system is particularly sensitive to the negative effects of low-dose mercury exposure. The population at highest risk is the children of women who consume large amounts of fish and seafood during pregnancy. The risk to that population is likely to result in an increase in the number of children who have to struggle to keep up in school and who might require remedial classes. Because of the beneficial effects of fish consumption, the long-term goal needs to be a reduction in the concentrations of mercury in fish rather than a replacement of fish in the diet by other foods. In the interim, the best method of maintaining fish consumption and minimizing mercury exposure is the consumption of fish known to have lower mercury concentrations.

October 14, 2000

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Thank you for participating in this focus group today. I'll be leading you in a discussion about how consumers should be informed about health risks.

Before we start, let's go around the room and introduce ourselves. Tells us your first name and something about your household—how many people in your household, any children?

FISH CONSUMPTION QUESTIONS:

Just for some background, before we get into our discussion of health risks, I'd like to ask you a few questions about fish.

How many of you eat fish or seafood of any kind? What do you eat? How often? If don't eat, why? What are the advantages of eating fish? Disadvantages?

I. Consumer Priors

Let's talk first about possible environmental contaminants that can get into the air we breathe the water we drink or in the foods we eat, things like mercury or lead or pesticides.

First of all, have you heard about any of these contaminants? What have you heard? How are the risks from these kinds of substances similar or different from other kinds of problems such as industrial pollution, toxic spills, or food poisoning?

Where do you think you are most likely to be exposed to pesticides? (probe: environmental sources, food sources)

What about things like mercury? Where are people likely to be exposed to mercury? (probe: environmental sources, food sources)

What kind of information do you as a consumer need to protect yourself from exposure to these kinds of environmental contaminants? Is it the same for accidental exposure vs. chronic (everyday) exposure? Who should provide the information and how should it be provided?

Now let's look at some examples of information about the hazards of mercury in food that might be provided to consumers, either in the form of booklets, on the internet, or in a news story.

What we are interested in here, is not so much how the information is laid out on the pages, but the type of information and the types of messages in the information. Are the key points made clearly? Who is the target of the message? Is there enough detail? Too much?

HANDOUT FIRST EXAMPLE

A. First, let's focus on the introduction.

Does this handout do a good job of describing the hazard from mercury?

Will this kind of introduction help you understand who should pay attention to the following advice and why?

Do you find anything about this introduction confusing?

Is there any important information that is missing from the introduction?

B. Advice

NOTE: Could make notes on flipchart: What is unique or different about this example? How would you describe the approach here? (probes: level of detail, how risky fish specified, nature of advice (do not eat, high vs. low levels of mercury), extent targets at-risk only or includes others, clarity of advice, how practical to use, how compelling as a whole, any gaps or missing information wanted)

What is the most important point you take from this consumer advice?

Does this handout do a good job at explaining who should be worried about mercury? Explain.

What is distinctive about this approach?

How are the risky kinds of fish specified?

How well does this advice work for pregnant women?

How will other people understand and use this advice?

TUNA:

Let's focus for a few minutes on the advice related to canned tuna. What do you think about this advice? Will it change what you do? Why or why not?

Why do you think canned tuna is listed separately? Is this a good idea or not?

QUANTITATIVE ADVICE:

Is the information about how often to eat fish easy to understand, or not? Explain. Is it easy to use, or not?

How would you use this information about how often each type of fish can be eaten? PROBE: Can each type of fish listed be eaten the specified number of times or are people supposed to combine across types of fish?

What does it mean to say certain fish are low in mercury?

How do you think pregnant women will factor this kind of advice into everything else they are concerned about with respect to the health of their baby? Will this be more or less of a concern than other risks?

How will other people factor this advice into their dietary choices?

IF PARTICIPANTS SAY: Will stop eating fish: Ask --all types of fish or just ones shown in the handouts as high?

What would you eat instead?

FOR EPA EXAMPLE: CLARIFY—WHAT IS TABLE 1 TELLING YOU? WHAT ABOUT TYPES OF FISH THAT AREN'T IN EITHER TABLE 1 OR TABLE 2? (I.E., HOW MANY CATEGORIES OF FISH ARE COVERED IN THIS INFORMATION?)

WHAT DOES MODERATION MEAN, WITH RESPECT TO FISH CONSUMPTION? (to you personally, what is "moderate"?)

HOW IMPORTANT IS IT FOR CONSUMERS/PREGNANT WOMEN TO EAT FISH? EXPLAIN.

CONCLUSIONS

Based on our discussions tonight, what do you think are the most critical pieces of information that should be provided to consumers? Who should get this information?

FDA WARNS CONSUMERS WHO ARE—

PREGNANT

THINKING OF BECOMING PREGNANT IN THE NEXT 6 MONTHS

NURSING A BABY

CHOOSE THE FISH YOU EAT CAREFULLY

4 types of fish contain high levels of methyl mercury residues that can harm developing fetuses and nursing babies. The methyl mercury can accumulate in your body, so it is important to limit the amount you eat.

BE AWARE OF THESE 4 FISH --- LIMIT WHAT YOU EAT

Mackerel	DO NOT EAT
Shark	DO NOT EAT
Swordfish	DO NOT EAT
Tuna	
Fresh, Frozen	3 Times a Month
Canned	4 (3 oz. servings) a week

All other types of fish are safe to eat, such as shellfish, halibut, or processed fish, such as fish sticks.

ADVICE ON FISH CONSUMPTION FOR WOMEN WHO ARE PREGNANT OR MAY BECOME PREGNANT WITHIN SIX MONTHS AND NURSING MOTHERS

What King of Fish Should I eat?

Women who are or may become pregnant within six months and nursing mothers should consume types of fish known to have low levels of mercury and should avoid fish known to have high mercury levels. The fish in Table 1 can generally be eaten a total of 2-3 times per week without concern for adverse effects from mercury, with each meal size being 6 ounces of cooked fish or 8 ounces of uncooked fish. Breaded fish sticks, fish sandwiches and imitation crab meat are generally made from these fish and so usually have low levels of mercury.

TABLE 1: Fish and Seafood That Are Generally Low in Mercury – May be Consumed a Total of 2-3 Time Per Week by Pregnant and Nursing Women

Abalone	Pompano
Anchovies	Salmon
Butterfish	Sardines
Clams	Scallops
Cod	Scups
Crab, King	Shrimp
Croaker	Smelt
Flounder	Sole
Haddock	Spot
Hake	Squid
Herring	Tilapia
Mackerel, Atlantic	Turbot
Mullet	Whitefish
Oysters	Whiting
Octopus	

TABLE 2: Fish and Seafood That Are Generally High in Mercury – Should be Avoided by Pregnant and Nursing Women

King Mackerel
Shark
Swordfish
Tilefish (Ocean Whitefish)

What about Tuna?

For canned tuna, which is the most frequently consumed purchased fish, a total of two to three (3 ounce) cans may be consumed per week.

What about Fish Not on the Lists?

For all other fish and seafood not mentioned, consumption should be limited to one meal per week (6 ounces cooked, 8 ounces uncooked.)

The Fish

Safe Eating Guidelines

Fresh Water Fish

- ❖ Brook trout and landlocked salmon Limit: 1 meal per month for pregnant and nursing women, women who may get pregnant, and children under 8.
1 meal per week for all others
- ❖ All other fish species Limit: NO meals for pregnant and nursing women, women who may get pregnant, and children under 8.
2 meals per month for all others

Ocean Fish and Shellfish

- ❖ Striped bass and bluefish Limit: 2 meals per month for everyone
- ❖ Swordfish and shark Limit: NO meals for pregnant and nursing women, women who may get pregnant, and children under 8.
2 meals per month for all others
- ❖ Atlantic salmon or mackerel, cod, haddock, hake, flounder, pollock, smelt and clams, lobsters, scallops, shrimp No limits for anyone as part of a balanced diet
But no one should eat lobster tomalley

American Favorites

- ❖ Canned tuna (the 6 ounce size) "White" tuna has more mercury than "light" tuna. Limit: 1 can of "white" or 2 cans of "light" tuna per week for pregnant and nursing women, women who may get pregnant, and children under 8.
No limits for all others as part of a balanced diet.
- ❖ Fish sticks and canned salmon No limits for anyone as part of a balanced diet

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**DEPARTMENT OF HEALTH AND HUMAN SERVICES
ASSISTANT SECRETARY FOR PLANNING AND EVALUATION**

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From: Stacey Katz
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Date: 10/3/00

Number of pages (including cover): 8

Comments:

Attached:

1. Workgroup list
2. Maine fish advisory
3. Draft language on mercury toxicity
4. Excerpts from Dietary Guidelines

Next meeting:

Thursdāy Oct. 5, 12:00 - 1:30 (Bring your lunch!)
Humphrey Bldg., Room 440D
Call in: 1-888-381-5777 code 16198

LIMITING
Extensive focus
group testing

10/03/00 14:57 FAX 202 401 7321

ASPE/HP

003/008

Fish is good for you.
Eat fish low in mercury!



The Fish

Safe Eating Guidelines

Fresh Water Fish

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No limits for all others as part of a balanced diet
- ❖ Fish sticks and canned salmon No limits for anyone as part of a balanced diet

WARNING ABOUT EATING FRESHWATER FISH

Warning: Mercury in Maine freshwater fish may harm the babies of pregnant and nursing mothers, and young children.

SAFE EATING GUIDELINES

- Pregnant and nursing women, women who may get pregnant, and children under age 8 **SHOULD NOT EAT** any freshwater fish from Maine's inland waters. Except, for brook trout and landlocked salmon, 1 meal per month is safe.
- All other adults and children older than 8 **CAN EAT 2** freshwater fish meals per month. For brook trout and landlocked salmon, the limit is 1 meal per week.

It's hard to believe that fish that looks, smells, and tastes fine may not be safe to eat. But the truth is that fish in Maine lakes, ponds, and rivers have mercury in them. Other states have this problem too. Mercury in the air settles into the waters. It then builds up in fish. For this reason, older fish have higher levels of mercury than younger fish. Fish (like pickerel and bass) that eat other fish have the highest mercury levels.

Small amounts of mercury can harm a brain starting to form or grow. That is why unborn and nursing babies, and young children are most at risk. Too much mercury can affect behavior and learning. Mercury can harm older children and adults, but it takes larger amounts. It may cause numbness in hands and feet or changes in vision. The Safe Eating Guidelines identify limits to protect everyone.

Warning: Some Maine waters are polluted, requiring additional limits to eating fish.

Fish caught in some Maine waters have high levels of PCBs, Dioxins or DDT in them. These chemicals can cause cancer and other health effects. The Bureau of Health recommends additional fish consumption limits on the waters listed below. **Remember** to check the mercury guidelines. If the water you are fishing is listed below, check the mercury guideline above and follow the most limiting guidelines.

SAFE EATING GUIDELINES

- Androscoggin River Gilead to Merymeeting Bay: 6-12 fish meals a year.
- Dennys River Meddybemps Lake to Dead Stream: 1-2 fish meals a month.
- Green Pond, Chapman Pit, & Greenlaw Brook (Limestone): Do not eat any fish from these waters.
- Little Madawaska River & tributaries (Madwaska Dam to Grimes Mill Road): Do not eat any fish from these waters.
- Kennebec River Augusta to the Chops: Do not eat any fish from these waters.
- Shawmut Dam in Fairfield to Augusta: 5 trout meals a year, 1-2 bass meals a month.
- Madison to Fairfield: 1-2 fish meals a month.
- Meduxnekeag River: 2 fish meals a month.
- North Branch Presque Isle River: 2 fish meals a month.
- Penobscot River below Lincoln: 1-2 fish meals a month.
- Prestle Stream: 1 fish meal a month.
- Red Brook in Scarborough: 6 fish meals a year.
- Salmon Falls River below Berwick: 6-12 fish meals a year.
- Sebasticook River (East Branch, West Branch & Main Stem) (Corinna/Hartland to Winslow): 2 fish meals a month.

For more details, including warnings on striped bass, bluefish and lobster tomalley call (207)-287-6455 or visit our web site at janus.state.me.us/dhs/boh/tp/index.html



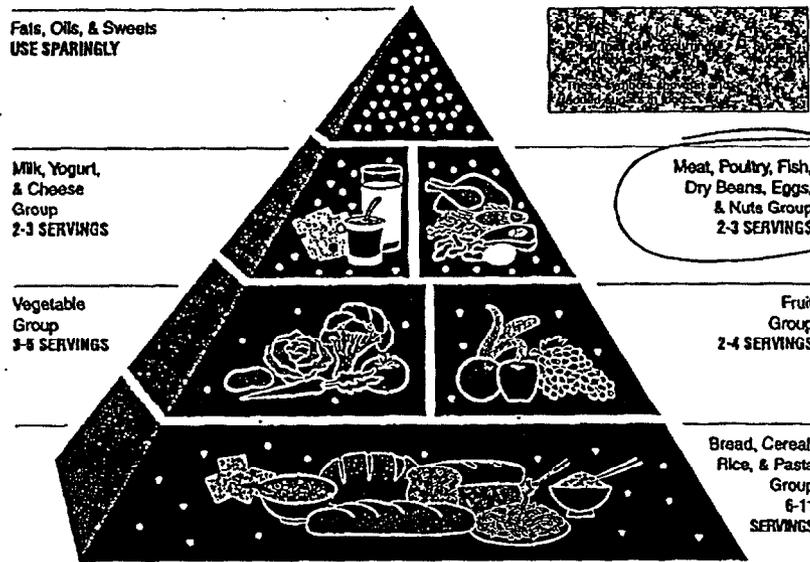
Revised August 29, 2000
Environmental Toxicology
Program
Maine Bureau of Health

Excerpts from Dietary Guidelines

Build a Healthy Base

Figure 2

Food Guide Pyramid
A Guide to Daily Food Choices



Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services



Box 8

WHAT COUNTS AS A SERVING?

Bread, Cereal, Rice, and Pasta Group (Grains Group)—whole grain and refined

- 1 slice of bread
- About 1 cup of ready-to-eat cereal
- 1/2 cup of cooked cereal, rice, or pasta

Vegetable Group

- 1 cup of raw leafy vegetables
- 1/2 cup of other vegetables—cooked or raw
- 3/4 cup of vegetable juice

Fruit Group

- 1 medium apple, banana, orange, pear
- 1/2 cup of chopped, cooked, or canned fruit
- 3/4 cup of fruit juice

Milk, Yogurt, and Cheese Group (Milk Group)*

- 1 cup of milk** or yogurt**
- 1 1/2 ounces of natural cheese** (such as Cheddar)
- 2 ounces of processed cheese** (such as American)

Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group (Meat and Beans Group)

- 2-3 ounces of cooked lean meat, poultry, or fish
- 1/2 cup of cooked dry beans* or 1/2 cup of tofu counts as 1 ounce of lean meat
- 2 1/2-ounce soyburger or 1 egg counts as 1 ounce of lean meat
- 2 tablespoons of peanut butter or 1/3 cup of nuts counts as 1 ounce of meat

NOTE: Many of the serving sizes given above are smaller than those on the Nutrition Facts Label. For example, 1 serving of cooked cereal, rice, or pasta is 1 cup for the label but only 1/2 cup for the Pyramid.

* This includes lactose-free and lactose-reduced milk products. One cup of soy-based beverage with added calcium is an option for those who prefer a non-dairy source of calcium.

** Choose fat-free or reduced-fat dairy products most often.

Dry beans, peas, and lentils can be counted as servings in either the meat and beans group or the vegetable group. As a vegetable, 1/2 cup of cooked, dry beans counts as 1 serving. As a meat substitute, 1 cup of cooked, dry beans counts as 1 serving (2 ounces of meat).

Choose Sensibly

Box 16

FOOD CHOICES LOW IN SATURATED FAT AND CHOLESTEROL AND MODERATE IN TOTAL FAT

Get most of your calories from plant foods (grains, fruits, vegetables). If you eat foods high in saturated fat for a special occasion, return to foods that are low in saturated fat the next day.

Fats and Oils

- Choose vegetable oils rather than solid fats (meat and dairy fats, shortening).
- If you need fewer calories, decrease the amount of fat you use in cooking and at the table.

Meat, Poultry, Fish, Shellfish, Eggs, Beans, and Nuts

- Choose 2 to 3 servings of fish, shellfish, lean poultry, other lean meats, beans, or nuts daily. Trim fat from meat and take skin off poultry. Choose dry beans, peas, or lentils often.
- Limit your intake of high-fat processed meats such as bacon, sausages, salami, bologna, and other cold cuts. Try the lower fat varieties (check the Nutrition Facts Label).
- Limit your intake of liver and other organ meats. Use egg yolks and whole eggs in moderation. Use egg whites and egg substitutes freely when cooking since they contain no cholesterol and little or no fat.

Dairy Products

- Choose fat-free or low-fat milk, fat-free or low-fat yogurt, and low-fat cheese most often. Try switching from whole to fat-free or low-fat milk. This decreases the saturated fat and calories but keeps all other nutrients the same.

Prepared Foods

- Check the Nutrition Facts Label to see how much saturated fat and cholesterol are in a serving of prepared food. Choose foods lower in saturated fat and cholesterol.

Foods at Restaurants or Other Eating Establishments

- Choose fish or lean meats as suggested above. Limit ground meat and fatty processed meats, marbled steaks, and cheese.
- Limit your intake of foods with creamy sauces, and add little or no butter to your food.
- Choose fruits as desserts most often.

Following the tips in the box above will help you keep your intake of saturated fat at less than 10 percent of calories. They will also help you keep your cholesterol intake less than the Daily Value of 300 mg/day listed on the Nutrition Facts Label. If you want more flexibility, see box 17 to find out your saturated fat limit in grams. The maximum number of saturated fat grams depends

on the amount of calories you get daily. Use Nutrition Facts Labels to find out how much saturated fat is in prepared foods. If you choose one food that is higher in saturated fat, make your other choices lower in saturated fat. This will help you stay under your saturated fat limit for the day.

Choose a diet that is low in saturated fat and cholesterol and moderate in total fat

Fats supply energy and essential fatty acids, and they help absorb the fat-soluble vitamins A, D, E, and K, and carotenoids. You need some fat in the food you eat, but choose sensibly. Some kinds of fat, especially saturated fats, increase the risk for coronary heart disease by raising the blood cholesterol (see box 15). In contrast, unsaturated fats (found mainly in vegetable oils) do not increase blood cholesterol. Fat intake in the United States as a proportion of total calories is lower than it was many years ago, but most people still eat too

much saturated fat. Eating lots of fat of any type can provide excess calories.

Choose foods low in saturated fat and cholesterol

See box 16 for tips on limiting the amount of saturated fat and cholesterol you get from your food. Taking these steps can go a long way in helping to keep your blood cholesterol level low.

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Box 15

KNOW THE DIFFERENT TYPES OF FATS

Saturated Fats

Foods high in saturated fats tend to raise blood cholesterol. These foods include high-fat dairy products (like cheese, whole milk, cream, butter, and regular ice cream), fatty fresh and processed meats, the skin and fat of poultry, lard, palm oil, and coconut oil. Keep your intake of these foods low.

Dietary Cholesterol

Foods that are high in cholesterol also tend to raise blood cholesterol. These foods include liver and other organ meats, egg yolks, and dairy fats.

Trans Fatty Acids

Foods high in trans fatty acids tend to raise blood cholesterol. These foods include those high in partially hydrogenated vegetable oils, such as many hard margarines and shortenings. Foods with a high amount of these ingredients include some commercially fried foods and some bakery goods.

Unsaturated Fats

Unsaturated fats (oils) do not raise blood cholesterol. Unsaturated fats occur in vegetable oils, most nuts, olives, avocados, and fatty fish like salmon. Unsaturated oils include both *monounsaturated fats* and *polyunsaturated fats*. Olive, canola, sunflower, and peanut oils are some of the oils high in monounsaturated fats. Vegetable oils such as soybean oil, corn oil, and cottonseed oil and many kinds of nuts are good sources of polyunsaturated fats. Some fish, such as salmon, tuna, and mackerel, contain omega-3 fatty acids that are being studied to determine if they offer protection against heart disease. Use moderate amounts of food high in unsaturated fats, taking care to avoid excess calories.

Is mercury in fish a safety concern?

 Fish is an important source of high-quality protein, vitamins and minerals. FDA seafood specialists say that eating a variety of types of fish, the normal pattern of consumption, does not put any one in danger of mercury poisoning. It is when people eat fad diets - frequently eating only one type of food or a particular species of fish - that they put themselves at risk.

Pregnant women and women of childbearing age, who may become pregnant, however, are advised by FDA experts, to limit their consumption of shark and swordfish to no more than once a month. These fish have much higher levels of methyl mercury than other commonly consumed fish. Since the fetus may be more susceptible than the mother to the adverse effects of methyl mercury, FDA experts say that it is prudent to minimize the consumption of fish that have higher levels of methyl mercury, like shark and swordfish. This advice covers both pregnant women and women of childbearing age who might become pregnant, since the first trimester of pregnancy appears to be the critical period of exposure for the fetus. Dietary practices immediately before pregnancy would have a direct bearing on fetal exposure during the first trimester, the period of greatest concern.

FDA toxicologists have determined that for persons other than pregnant women and women of childbearing age who may become pregnant, regular consumption of fish species with methyl mercury levels around 1 part per million (ppm)--such as shark and swordfish--should be limited to about 7 ounces per week (about one serving) to stay below the acceptable daily intake for methyl mercury. For fish with levels averaging 0.5 ppm, regular consumption should be limited to about 14 ounces per week. Current evidence indicates that nursing women who follow this advice do not expose their infants to increased risk from methyl mercury.

Consumption advice is unnecessary for the top 10 seafood species, making up about 80 percent of the seafood market--canned tuna, shrimp, pollock, salmon, cod, catfish, clams, flatfish, crabs, and scallops. This is because the methyl mercury levels in these species are all less than 0.2 ppm and few people eat more than the suggested weekly limit of fish (2.2 pounds) for this level of methyl mercury contamination.

FDA's action level of 1 ppm for methyl mercury in fish was established to limit consumers' methyl mercury exposure to levels 10 times lower than the lowest levels associated with adverse effects. (paresthesia) observed in the poisoning incidents. FDA based its action level on the lowest level at which adverse effects were found to occur in adults. This is because the level of exposure was actually lower than the lowest level found to affect fetuses, affording them greater

protection.

Source: Excerpted from FDA Consumer, May 1995 update: Mercury in Fish:
Cause for Concern?

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**U. S. Food and Drug Administration
FDA Consumer
September 1994; Revised May 1995**

Mercury In Fish: Cause For Concern?

Swordfish and shark taste great--especially grilled or broiled. But reports that these and some other large predatory fish may contain methyl mercury levels in excess of the Food and Drug Administration's 1 part per million (ppm) limit has dampened some fish lovers' appetites.

FDA scientists responsible for seafood safety are also concerned about the safety of the eating these types of fish, but they agree that the fish are safe, provided they are eaten infrequently (no more than once a week) as part of a balanced diet.

Mercury Is Everywhere

Mercury occurs naturally in the environment. According to FDA toxicologist Mike Bolger, Ph.D., approximately 2,700 to 6,000 tons of mercury are released annually into the atmosphere naturally by degassing from the Earth's crust and oceans. Another 2,000 to 3,000 tons are released annually into the atmosphere by human activities, primarily from burning household and industrial wastes, and especially from fossil fuels such as coal.

Mercury vapor is easily transported in the atmosphere, deposited on land and water, and then, in part, released again to the atmosphere. trace amounts of mercury are soluble in bodies of water, where bacteria can cause chemical changes that transform mercury to methyl mercury, a more toxic form.

Fish absorb methyl mercury from water as it passes over their gills and as they feed on aquatic organisms. Larger predator fish are exposed to higher levels of methyl mercury from their prey.

Methyl mercury binds tightly to the proteins in fish tissue, including muscle. Cooking does not appreciably reduce the methyl mercury content of the fish.

Nearly all fish contain trace amounts of methyl mercury, some more than others. In areas where there is industrial mercury pollution, the levels in the fish can be quite elevated. In general, however, methyl mercury levels for most fish range from less than 0.01 ppm to 0.5 ppm. It's only in a few species of fish that

methyl mercury levels reach FDA limit for human consumption of 1 ppm. This most frequently occurs in some large predator fish, such as shark and swordfish. Certain species of very large tuna, typically sold as fresh steaks or sushi, can have levels over 1 ppm. (Canned tuna, composed of smaller species of tuna such as skipjack and albacore, has much lower levels of methyl mercury, averaging only about 0.17 ppm.) The average concentration of methyl mercury for commercially important species (mostly marine in origin) is less than 0.3 ppm.

FDA works with state regulators when commercial fish, caught and sold locally, are found to contain methyl mercury levels exceeding 1 ppm. The agency also checks imported fish at ports and refuses entry if methyl mercury levels exceed the FDA limit.

Spot-caught predator fresh-water species like pike and walleye sometimes have methyl mercury levels in the 1 ppm range. Other fresh-water species also have elevated levels, particularly in areas where mercury levels in the local environment are elevated.

FDA suggests sports fishers check with state or local governments for advisories about water bodies or fish species. These advisories provide up-to-date public health information on local areas and warn of areas or species where mercury (or other contamination) is of concern.

Safety Studies

Eating commercially available fish should not be a problem, say FDA toxicologists. The 1 ppm limit FDA had set for commercial fish is considerably lower than levels of methyl mercury in fish that have caused illness.

For information about the likely outcome of eating fish with low levels of methyl mercury, scientists look to studies of persons exposed to high levels; in particular, studies of two poisoning episodes from highly contaminated fish in Japan in the 1960's, and another poisoning incident in Iraq in the 1970's involving contaminated grain.

In the first episode, which occurred in Minimata, Japan, 111 people died or became very ill (mostly from nervous system damage) from eating fish (often daily over extended periods) from waters that were severely polluted with mercury from local industrial discharge.

Following a similar incident in Nigata, Japan, where 120 person were poisoned, studies showed that the harm caused by methyl mercury poisoning, particularly the neurological symptoms, can progress over a period of years after exposure has ended. The average mercury content of fish samples from both areas ranged from 9 to 24 ppm, though in Minimata, some fish were found to have levels as high as 40 ppm. Fortunately, no similar incidents have occurred in the

United States.

The best indexes of exposure to methyl mercury are concentrations in hair and blood. The average concentrations of total mercury in non-exposed people is about 8 parts per billion (ppb) in blood and 2 ppm in hair. From the Japanese studies, toxicologists have learned that the lowest mercury level in adults associated with toxic effects (paresthesia) was 200 ppb in blood and 50 ppm in hair, accumulated over months to years of eating contaminated food.

The Japanese studies did not, however, provide information on what levels of methyl mercury might adversely affect the fetus and infant.

"There is no doubt that when humans are exposed to high levels of methyl mercury, poisoning and problems in the nervous system can occur," Bolger says.

The types of symptoms reflect the degree of exposure. Paresthesia (numbness and tingling sensations around the lips, fingers and toes) usually is the first symptom. A stumbling gait and difficulty in articulating words is the next progressive symptom, along with a constriction of the visual fields, ultimately leading to tunnel vision and impaired hearing. Generalized muscle weakness, fatigue, headache, irritability, and inability to concentrate often occur. In severe cases, tremors or jerks are present. These neurological problems frequently lead to coma and death.

"During prenatal life, human are susceptible to the toxic effects of high methyl mercury exposure levels because of the sensitivity of the developing nervous system," Bolger explains. Methyl mercury easily crosses the placenta, and the mercury concentration rises to 30 percent higher in fetal red blood cells than in those of the mother.

"But none of the studies of methyl mercury poisoning victims have clearly shown the level at which newborns can tolerate exposure," Bolger says. "It is clear that at exposure levels that affect the fetus, adults are also susceptible to adverse effects. What is not clear the effect, if any, on fetuses at much lower levels--those that approach current exposure levels through normal fish consumption."

Studies of the poisoning incident in Iraq have provided limited data about what effects low levels of methyl mercury exposures to the fetus have on the infant. One possible effect, for example, is lateness in walking. In the fall and winter of 1971-72, wheat seed intended for planting--and which had therefore been treated with an alkyl mercury fungicide--was mistakenly used to prepare bread; more than 6,500 Iraqis were hospitalized with neurological symptoms and 459 died. The vast majority of the mothers experienced exposures that resulted in hair levels greater than the lowest levels associated with effects in adults. But there was no clear evidence that the fetus was more sensitive than the adult to

methyl mercury.

Another study on methyl mercury toxicity was published by the World Health Organization in 1990. It concluded, "the general population does not face a significant health risk from methyl mercury." Bolger says there is a consensus among scientists on all the results of this study except for the findings related to the relationship between low exposure levels and fetal toxicity.

Searching for More Information

FDA and the National Institute of Environmental Health Sciences are supporting a study by the University of Rochester to gather conclusive data on the effects of long-term exposure to low levels of methyl mercury in the fetus and infant. The study is being conducted in the Seychelles Islands, off the coast of East Africa in the Indian Ocean.

Fish is the major source of protein for people in the Seychelles Islands. Begun about 10 years ago, the study focuses on the approximately 700 pregnancies that occur on the islands each year.

"That's more significant database than we had in the Iraqi study," says Bolger. "Also, the population is mostly Muslim," he says, a religion that prohibits smoking and drinking, behaviors that could affect the prenatal health of fetuses (and interfere with efforts to understand the subtle effects of methyl mercury).

The study tracks women from pregnancy to childbirth, and monitors the babies' consumption of breast milk. As children grow older, they are followed for any signs of nervous system disorders. Reports from the Seychelles study are not ready for publication, but Bolger expects the results to make a significant contribution to the consideration of whether further controls or other actions may be needed.

FDA Advice for Consumers

Fish is an important source of high-quality protein, vitamins and minerals. FDA seafood specialists say that eating a variety of types of fish, the normal pattern of consumption, does not put any one in danger of mercury poisoning. It is when people eat fad diets - frequently eating only one type of food or a particular species of fish - that they put themselves at risk.

Pregnant women and women of childbearing age, who may become pregnant, however, are advised by FDA experts, to limit their consumption of shark and swordfish to no more than once a month. These fish have much higher levels of methyl mercury than other commonly consumed fish. Since the fetus may be more susceptible than the mother to the adverse effects of methyl mercury, FDA

experts say that it is prudent to minimize the consumption of fish that have higher levels of methyl mercury, like shark and swordfish. This advice covers both pregnant women and women of childbearing age who might become pregnant, since the first trimester of pregnancy appears to be the critical period of exposure for the fetus. Dietary practices immediately before pregnancy would have a direct bearing on fetal exposure during the first trimester, the period of greatest concern.

FDA toxicologists have determined that for persons other than pregnant women and women of childbearing age who may become pregnant, regular consumption of fish species with methyl mercury levels around 1 part per million (ppm)--such as shark and swordfish--should be limited to about 7 ounces per week (about one serving) to stay below the acceptable daily intake for methyl mercury. For fish with levels averaging 0.5 ppm, regular consumption should be limited to about 14 ounces per week. Current evidence indicates that nursing women who follow this advice do not expose their infants to increased risk from methyl mercury.

Consumption advice is unnecessary for the top 10 seafood species, making up about 80 percent of the seafood market--canned tuna, shrimp, pollock, salmon, cod, catfish, clams, flatfish, crabs, and scallops. This is because the methyl mercury levels in these species are all less than 0.2 ppm and few people eat more than the suggested weekly limit of fish (2.2 pounds) for this level of methyl mercury contamination.

FDA's action level of 1 ppm for methyl mercury in fish was established to limit consumers' methyl mercury exposure to levels 10 times lower than the lowest levels associated with adverse effects. (paresthesia) observed in the poisoning incidents. FDA based its action level on the lowest level at which adverse effects were found to occur in adults. This is because the level of exposure was actually lower than the lowest level found to affect fetuses, affording them greater protection.

FDA toxicologists are developing a more complete database for addressing low-level methyl mercury exposures from fish; however, they consider the 1 ppm limit to provide an adequate margin of safety. This doesn't mean that it is safe to regularly and frequently eat fish that contain 1 ppm methyl mercury. The limit was established taking into consideration the types of fish people eat, the levels of methyl mercury present in each species, and the amounts of fish that are normally consumed.

Not everyone agrees, however, about what advice to provide to consumers. This is particularly evident in sport fish advisories provided by states around the country. Because states often use different criteria for their fish advisories, adjoining states may provide different advice about fish from the same bodies of water. Some states have adopted a zero risk approach and have advised consumers not to eat certain species, while others have advocated a limit on

intake that is more consistent with the FDA approach.

Despite these differences, efforts by the states remain a valuable guide for alerting people to possible mercury contamination in certain fish species in particular bodies of water. Federal efforts are being made to increase uniformity in fishing advisories.

Sample Results

Results of FDA surveillance sampling for methyl mercury in fish from October 1992 through September 1994 are shown below. At least five samples of each species were analyzed. If a species was sampled in both fiscal years, only the FY 1994 results are shown. The limit of quantifiable detection is 0.10 part per million (ppm); therefore, any values less than 0.10 ppm are shown as ND (not detected). FDA's action level is 1 ppm.

Species	Range (ppm)	Average (ppm)
Domestic Samples		
Catfish	ND - 0.16	ND
Cod	ND-0.17	0.13
Crab	ND-0.27	0.13
Flounder	ND	ND
Hake	ND	ND
Halibut	0.12 - 0.63	0.24
Pollock	ND	ND
Salmon (canned)	ND	ND
Salmon (fresh or frozen)	ND	ND
Shark	0.30 - 3.52	0.84
Swordfish	0.36 - 1.68	0.88
Tuna (canned)	ND - 0.34	0.20
Tuna (fresh or frozen)	ND - 0.76	0.38

Import Samples		
Pollock	ND - 0.78	0.16
Shark	ND - 0.70	0.36
Swordfish	0.80 - 1.61	0.86
Tuna (canned)	ND - 0.39	0.14
Tuna (fresh of frozen)	ND - 0.75	0.27

Questions?

FDA invites consumers who have questions about methyl mercury in fish or other seafood concerns to telephone the 24-hour FDA Seafood Hotline at (1-800) FDA-4010 or (202) 205-4314 (in the Washington, D.C., area). The automated hot line and Flash Fax service are available 24 hours a day. Public affairs specialists can be reached at the same numbers from noon to 4 p.m. Eastern time, Monday through Friday.

by Judith E. Foulke

*This is a mirror of the page at
<http://www.fda.gov/opacom/catalog/mercury.html>*

[Home](#)

Manual Revision
of 9/2/20

Example 1

Warning: Mercury in fish may harm the babies of pregnant and nursing mothers, and young children.

Maine Version
Variation of Intro

Example 2

Small amounts of mercury can harm a brain starting to form or grow. That is why unborn and nursing babies, and young children are most at risk. Too much mercury can affect behavior and learning. Mercury can harm older children and adults but it takes larger amounts. It may cause numbness in hands and feet or changes in vision.

The Fish Safe Eating Guidelines

Fresh Water Fish

- ❖ Brook trout and landlocked salmon Limit: 1 meal per month for pregnant and nursing women, women who may get pregnant, and children under 8.
1 meal per week for all others
- ❖ All other fish species Limit: NO meals for pregnant and nursing women, women who may get pregnant, and children under 8.
2 meals per month for all others

Ocean Fish and Shellfish

- ❖ Striped bass and bluefish Limit: 2 meals per month for everyone
- ❖ Swordfish and shark Limit: NO meals for pregnant and nursing women, women who may get pregnant, and children under 8.
2 meals per month for all others
- ❖ Atlantic salmon or mackerel, cod, haddock, hake, flounder, pollock, smelt No limits for anyone as part of a balanced diet
and clams, lobsters, scallops, shrimp But no one should eat lobster tomalley

American Favorites

- ❖ Canned tuna (the 6 ounce size)
"White" tuna has more mercury than "light" tuna. Limit: 1 can of "white" or 2 cans of "light" tuna per week for pregnant and nursing women, women who may get pregnant, and children under 8.
No limits for all others as part of a balanced diet
- ❖ Fish sticks and canned salmon No limits for anyone as part of a balanced diet

Example 3

A recent report from the National Academy of Sciences looked at the evidence that mercury can cause learning problems in children exposed to high levels of mercury in the mother's diet during pregnancy. Since fish are the main source of dietary exposure to mercury, the EPA and FDA are providing guidelines about the kinds and amount of fish that pregnant and nursing mothers and women of childbearing age can safely eat without exposing their children to any significant risk of harm.

What Kind of Fish Should I Eat?

Women who are or may become pregnant within six months and nursing mothers should consume types of fish known to have low levels of mercury (see Table 1) and should avoid fish known to have high mercury levels (see Table 2). The fish in Table 1 can generally be eaten a total of 2-3 times per week without concern for adverse effects from mercury, with each meal size being 6 ounces of cooked fish or 8 ounces of uncooked fish. Breaded fish sticks, fish sandwiches and imitation crab meat are generally made from these fish and so usually have low levels of mercury.

TABLE 1: Fish and Seafood That Are Generally Low in Mercury - May be Consumed a Total of 2-3 Times Per Week by Pregnant and Nursing Women.

Abalone	Pompano	Sole
Anchovies	Salmon Scallops	Spot
Butterfish	Sardines	Squid
Clams	Scups	Tilipia
Cod	Shrimp	Turbot
Crab, King	Smelt	Whitefish
Croaker	Sole	Whiting
Flounder	Herring	Oysters
Haddock	Mackerel, Atlantic	Octopus
Hake	Mullet	

What Fish Should I Avoid?

The fish in Table 2 are know to have high levels of mercury and should be avoided by women who are or may become pregnant within the next six months and nursing mothers.

TABLE 2. Fish and Seafood That Are Generally High in Mercury - Should be Avoided by Pregnant and Nursing Women.

King Mackerel	Shark	Swordfish	Tilefish(Ocean Whitefish)
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What about Tuna?

For canned tuna, which is the most frequently consumed purchased fish, a total of two to three 3 ounce cans may be consumed per week.

What About Fish Not on the Lists?

For all other fish and seafood not mentioned, consumption should be limited to one meal per week (6 ounces cooked, 8 ounces uncooked) by women who are or may become pregnant within 6 months and nursing mothers. This applies to fish bought in a store or restaurant and to all freshwater fish caught by you or your family in local waters.

NMFS Version
Intro and Advice

Example 4

Seafood is an important and growing part of the American diet. Seafood provides significant nutritional benefits to consumers. Some seafood, particularly large ocean fish and freshwater fish caught in contaminated waters, may contain levels of mercury that pose a risk to babies of pregnant and nursing mothers. The FDA and EPA advise women who are pregnant or may become pregnant within six months or are nursing mothers to follow the safe eating guidelines outline below. This advice should not be taken as a need to abstain from consuming seafood except as indicated.

Fish Safe-Eating Guidelines

FRESH WATER FARM-RAISED CATFISH OR TROUT

There is NO mercury concern for these species.

OCEAN FISH

Swordfish, Shark, King Mackerel, and Tilefish

NO meals for women who are pregnant, women who may become pregnant in the next six months and nursing mothers.

AMERICAN FAVORITES

Canned tuna (three-ounce serving). Up to four three-ounce servings per week for women who are pregnant, women who may become pregnant in the next six months and nursing mothers. NO limits for all others as part of a balanced diet.

There are no limits for anyone as a part of a balanced diet for the following top species which make up the majority of the seafood market. Canned Salmon Shrimp, Salmon, Pollock, Catfish, Cod, Clams, Flounder, Scallops and Fish Sticks. No one should eat lobster tomalley.

FDA Version
Intro and Advice

Example 5

Fish is an important source of high quality protein, vitamins and minerals. Certain fish species, however, are known to contain higher levels of mercury than others. Pregnant women and women of childbearing age are advised to eat a variety of seafood and to avoid eating those species that may contain higher levels of mercury. These species are listed below.

FDA WARNS CONSUMERS WHO ARE—

PREGNANT

THINKING OF BECOMING PREGNANT IN THE NEXT 6 MONTHS

NURSING A BABY

CHOOSE THE FISH YOU EAT CAREFULLY

4 types of fish contain high levels of methyl mercury residues that can harm developing fetuses and nursing babies. The methyl mercury can accumulate in your body, so it is important to limit the amount you eat.

BE AWARE OF THESE 4 FISH --- LIMIT WHAT YOU EAT

Mackerel	DO NOT EAT
Shark	DO NOT EAT
Swordfish	DO NOT EAT
Tuna	
Fresh, Frozen	3 Times a Month
Canned	4 (3 oz. servings) a week

All other types of fish are safe to eat, such as shellfish, halibut, or processed fish, such as fish sticks.

ADVICE EXAMPLE 4

Pregnant women and women of childbearing age who may become pregnant should know that the **risk of mercury exposure** to their unborn child increases measurably when they eat:

- More than 1 meal per month of shark, swordfish, or king mackerel
- More than 3 meals per month of fresh or frozen tuna (e.g., sushi, tuna steaks)
- More than five 6 ounce cans of canned tuna per month.

Moderate fish consumption as part of a balanced diet poses little risk, but pregnant women and women of childbearing age who may become pregnant may want to **avoid** fish with higher mercury levels such as shark, swordfish, or king mackerel

FISH PREPARATION TIPS

The way fish is selected and prepared can help reduce your exposure to contaminants.

Preparing whole fish: Select smaller fish of the species you want. Clean and dress the fish as soon as possible and remove and throw away the head, guts, kidneys and liver. Cut away the fat and skin, especially from the "belly flap" area. Fillet the fish.

Cooking fish: Grill, bake, broil or steam the fish so the juices from the fat drip off during cooking.