Alabama Department of Public Health

Fish Consumption Advisories

General

The State of Alabama has an abundance of clean rivers and lakes. These waters present people who fish with excellent recreation, while providing an abundance of good food. However, people who eat the fish they catch need to understand both the benefits and the risks of their fish consumption practices. This awareness is especially important in areas where the Alabama Department of Public Health (ADPH) has issued fish consumption advisories.

The benefits of fishing are many. Fishing provides stress-reducing recreational and outdoor activity needed for good health. Fish are high in protein; and low in fat, cholesterol, and calories when prepared properly.

Unfortunately, certain toxic chemicals have been found in some lakes and rivers in Alabama. Some of these chemicals can accumulate in fish. With some of the materials, higher levels of contaminants can be found in older and/or larger fish. When chemical concentrations are elevated in fish, they can pose health risks to people who eat them. Sampling of fish provides the information (levels of contaminants) needed for issuing the advisories.

The advisories are developed to inform people who eat fish which species of fish in which water bodies may present an elevated health hazard. They also explain the potential health hazards associated with eating certain contaminants. Finally, the advisories tell how to reduce contamination ingestion by changing the way the fish is prepared. The advisories are designed to provide sufficient information to permit people to make an informed choice on whether or how a great a risk to take from consuming fish that may be contaminated.

Contaminants in Fish

Fish consumption advisories have been issued for chlordane, DDT, mercury, and polychlorinated biphenyls (PCBs).

Chlordane is a chlorinated hydrocarbon frequently used as a pesticide until it was banned in the late 1980's. Contamination problems presently exist from run off in agricultural land and other areas where it was heavily used.

DDT is another chlorinated hydrocarbon used as a pesticide, especially against mosquitoes, during World War II. The United States permitted the commercial use of DDT in 1945. It was a widely used pesticide until it was banned in 1972.

Mercury is a naturally occurring element and is used in a variety of products such as barometers, thermometers, paints, and batteries, although manufacturers are seeking non-mercury alternatives for many of these uses. Manufacturers also use mercury in the production of chlorine, caustic soda, urethane foam, and other products. Such wide use has led to unintentional contamination of the environment. Mercury has also been taken up in growing trees and vegetation. Burning of the materials, either as wood or as coal, can result in the release of mercury into the air. A large source of this exposure route is from industries which burn coal as fuel. Once in the environment, mercury is converted to methyl mercury, which is the chemical form that is most hazardous to human health. In recent years, the government has promulgated regulations to limit or ban the use of mercury in various products and industrial processes.

PCBs constitute a class of compounds previously used in electrical capacitors and transformers and in the pressure treatment of lumber. These uses developed because the chemicals have good dielectric and fire resistance properties. In 1979 the U.S. Environmental Protection Agency (EPA) prohibited all manufacture of PCBs. However, due to the persistence of these materials in the environment, they can be leached into water bodies from where fish can be exposed.

All of these chemicals tend to persist in the environment. Chlordane, DDT, and PCBs collect in fatty tissue, while mercury collects in muscle tissue of fish. The presence of toxic contaminants in Alabama waters should decrease due to the current regulations which ban or restrict their use. The number of advisories should decrease as the contaminants work their way out of the waterways.

Advisories

Advisories help people who fish realize the potential health risks from eating contaminated fish and reduce those risks. When advisories are issued, people continue to catch fish and may choose to eat them; an advisory is advice—a recommendation.

Advisories are based on the risk of cancer or other serious illnesses that may result from eating contaminated fish. Laboratory animals exposed to a contaminant may experience more than one type of health effect. For example, an animal may develop cancer after exposure to a high dose, and the offspring of animals exposed to a low dose may have birth defects. In such cases, the level of the contaminant that may be permitted in the human food supply is calculated from the lower dose.

Advisories for contaminants that are known or suspected to cause cancer are based on a level of the chemical that caused cancer in animal studies or human populations. Cancer risk is usually described as the number of additional cancers than might be expected over a lifetime of regular consumption. Therefore, a person's cancer risk from eating a few fish from the area over a few years is slight.

Advisories for contaminants that do not cause cancer are based on a level of the chemical that is lower than the level that caused adverse health effects in animals. The safe level derived from animal studies to be is further divided by 100 or more to determine a daily level of intake that is likely to be without risk of adverse health effects for humans. The elderly, children, women of childbearing age or individuals with compromised immune systems may be particularly vulnerable to the effects of toxic substances. Therefore, some advisories particularly limit consumption for these very sensitive groups.

Alabama issues three types of advisories for specific fish species in defined areas of lakes and streams.

> A **no limit advisory** is for water bodies where fish were analyzed and found to contain no contaminants at levels that require posting. Fish from these bodies of water can be consumed with no restrictions.
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> A **limited consumption advisory** states that women of reproductive age and children less than 15 years old should avoid eating certain fish from these areas. Other people should limit their consumption of the particular species to one meal per month. The portion size of a fish meal for a 154 pound (70kg) individual is 6 ounces of cooked fish or 8 ounces of raw fish.
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> A **no consumption advisory** recommends that everyone avoid eating the named species of fish in the defined area.

The ADPH, in consultation with the Alabama Departments of Conservation and Natural Resources and Environmental Management, decided to shift to a more protective level for mercury. Mercury, which occurs both naturally and from man-made sources, can cause developmental disabilities and behavioral problems in children if it is consumed at high levels, placing women of childbearing age, pregnant women, and children younger than 15 years of age at risk. One way to minimize exposure is to eat fewer fish from contaminated waters.

The more protective level for mercury advisories this year are based on a stricter action level for mercury developed by the U.S. Environmental Protection Agency. The 2002 mercury advisories list the safe number of meals of fish that can be eaten in a given period of time, such as meals per week, meals per month or no consumption. A meal portion consists of 6 ounces of cooked fish or 8 ounces of raw fish. Previous mercury advisories were based on the U.S. Food and Drug Administration guidelines, which were based on eating one fish meal per week.

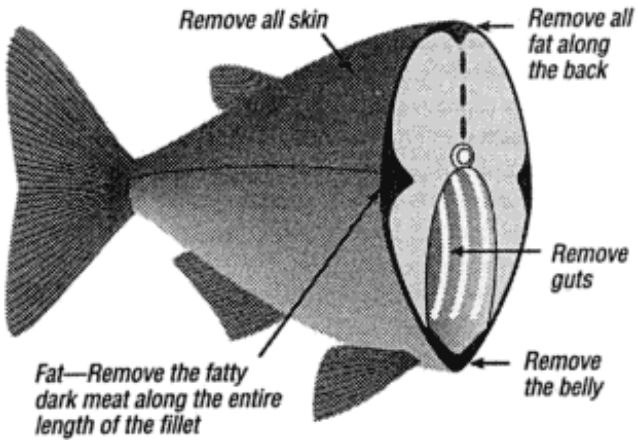
Reducing Consumption Risks

People who fish in an area in which an advisory has been issued can take actions to reduce risks from contaminants in fish. Four examples follow:

- Avoid eating fish that are under advisory. Chlordane, DDT, and PCBs tend to adsorb to (bind with) sediments. Crustaceans and mollusks from the bottoms of water bodies are eaten by small fish, which in turn, are eaten by larger species further up the food chain. Contaminants that began on the bottom are passed up the food chain and tend to

bioaccumulate in the older, larger fish. Eating fish that feed on the bottom of lakes and streams (catfish, carp, buffalo fish or suckers) should be avoided. However, in waterways contaminated with mercury, fish such as largemouth bass tend to store mercury in the muscle and should be eaten less often.

- Keep and eat smaller fish. Ingested contaminants are not easily removed from fish. They tend to be deposited in areas such as the fat, the skin, or muscle tissues. It's nice to bring home big fish, but the longer the exposure time to a chemical, the higher the chemical concentration in the fish tissue. As fish grow older, they tend to develop a higher overall body fat and muscle content. Fish at the higher levels in the food chain (e.g., bass for freshwater species, mackerel or shark for marine species) tend to bioaccumulate contaminants. Because the diets of these more aggressive species are primarily lower fish and crustaceans, these fish will consume and deposit in their own tissues those contaminants contained in the fish and crustaceans they eat.
- Eat fillets and cut away the fatty tissue. Cutting away most of the fatty tissue when cleaning fish is a third way to limit exposure to toxic chemicals. The skin, belly flap, and the fatty strip along the backbone and lateral line should be removed to reduce the amount of contaminants in the meal.



- Grill or broil fish fillets. Since some of the contaminants are stored in the fat, cook the fish in a manner that allows the juices (high in fat content) to drip away from the meat. Broiling and grilling are excellent ways to do this. Frying fish or putting them in soups or chowders does not remove the fat, and are not recommended cooking methods.

  Remember: Mercury is stored in muscle and cannot be removed by cutting away the fat or by broiling or grilling.

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