

Background Information

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Why We Have Advisories

Fishing is fun, and fish are an important part of a healthy diet. Fish contain high quality protein, essential nutrients, healthy fish oils, and are low in saturated fat. However, some fish contain chemicals at levels that may be harmful to health. To help people make healthier choices about which fish to eat, the New York State Department of Health (NYS DOH) issues advice about eating sportfish (the fish you catch).

Some fresh waters and marine waters (near New York City) are impacted by human activities and local or distant contamination sources. The fish from these waters are more likely to be contaminated than fish from other waters. People who eat the fish they catch, or get locally caught fish from others, often eat fish from a limited number of favorite fishing waters or locations. When those favorite waters/locations contain fish with higher contaminant levels, the people who eat them may have higher contaminant exposures. In general, fish from the market or a restaurant come from a wider variety of locations, including waters with less contaminated fish.

NYS DOH also issues [advice about game](#), such as snapping turtles and wild waterfowl. Game may also contain chemicals at levels of concern.

Health Risks from Contaminants in Fish and Game

The primary contaminants of concern in New York State fish and game have been mercury and polychlorinated biphenyls (PCBs). Other contaminants such as cadmium, chlordane, DDT, dieldrin, dioxin, mirex, and per- and polyfluoroalkyl substances (PFAS, previously known as perfluorinated chemicals or PFCs) are also concerns in fish from some of the State's waterbodies. These contaminants build up in your body as you continue to eat these fish and game over time. Health problems that may result from exposure to these contaminants range from small changes in health that are hard to detect to birth defects, reproductive and developmental effects, and cancer. For more detailed information about contaminants in fish and game please visit [About Chemicals & Bacteria in Fish](#).



Women who eat highly contaminated fish and game and become pregnant may have an increased risk of having children who are slower to develop and learn. Some contaminants may be passed on to infants in mother's milk. Exposure to contaminants may also have a greater effect on young children than adults.

People can get the health benefits of eating fish and reduce their exposures to contaminants by following the [NYS DOH advice](#). The advisories tell people which fish to avoid eating, and how to prepare and cook fish to reduce their exposures to contaminants in the fish they do eat. Women of childbearing age (under 50) and children under 15 are advised to limit the kinds of sportfish they eat and how often they eat them. Women beyond their childbearing years (over 50) and men may face fewer health risks from some chemicals. For that reason, the advice for women over age 50 and men over age 15 allows them to eat more kinds of sportfish and more often.

Basis for Setting Advisories

New York is a water-rich state: 2.6 million acres of water in Lakes Erie, Ontario, and Champlain; approximately 0.75 million acres in more than 4,000 smaller lakes; 70,000 miles of streams and rivers in 15 major watersheds; 150 tidal miles of the Hudson River estuary; and 1.1 million acres of marine waters extending three miles from shore. Many species of fish in these waters are sought by anglers.

In New York State, fish and game advisories are primarily based on information that the NYS Department of Environmental Conservation (NYS DEC) gathers on contaminant levels in fish and game. NYS DEC collects fish samples each year from different waterbodies. It varies from year to year, but NYS DEC annually collects and analyzes contaminants in about 1,500 fish from more than 50 locations/waters. Sampling focuses on waterbodies with known or suspected contamination, waterbodies susceptible to mercury contamination, popular fishing waters, and waters where trends in fish contamination are being monitored. Also, testing focuses on those species that are most likely to be caught and eaten by sport anglers. NYS DEC also tests some game species (e.g., waterfowl and snapping turtles) that accumulate chemical contaminants. NYS DOH reviews the NYS DEC testing results for fish and game to determine if an advisory should be issued or revised for a given waterbody, or for a particular species of fish or game. See [Fish and Game Advisory Derivation](#) below for more details.

Types of Advisories

To reduce exposure to contaminants, and help anglers and hunters choose which fish and game to keep for food, NYS DOH has the following types of health advice:

1. General Advice for Sportfish



The general health advisory for sportfish consumption is that people can eat up to four, one-half pound meals a month of fish (which should be spaced out to about a meal a week) from New York State fresh waters and some marine waters near the mouth of the Hudson River. If there is no specific advice for a waterbody, NYS DOH recommends following this general advice because:

- some chemicals are commonly found in New York State fish (e.g., mercury and PCBs);
- fish from all waters have not been tested; and
- fish may contain unidentified contaminants.

2. Specific Advice for Sportfish

For some waterbodies in New York, NYS DOH issues advice that is more restrictive (i.e., eat up to one meal per month or don't eat) than the general advice (eat up to four meals per month) for men over 15 and for women over age 50 because contaminant levels in some fish are higher. Waters that have specific advisories have at least one species of fish with an elevated contaminant level, which means that other fish species may also be affected. In nearly all cases, if a waterbody has any specific advice, NYS DOH, to be more protective, has advised that women under age 50 and children under age 15 should not eat any fish from that waterbody. The specific advice for a waterbody also applies to tributaries and connected waters if there are no dams, falls, or other barriers to stop the fish from moving upstream or downstream. This is because chemicals remain in fish when they move from one waterbody or location to another.

The information on our website (www.health.ny.gov/fish) will help you find which waterbodies in New York State have specific advisories, where they are located, and what that specific advice is. Our website also lists public access waters with the general advice; where the whole family can eat up to four meals per month.

3. Regional Advice for Sportfish

Regional advisories are issued because of regional patterns for a specific contaminant across the state (i.e., mercury) for several species that can be reasonably anticipated to apply to most or all waters in the region including those that have not been sampled. NYS DEC data indicate that certain fish from Adirondack and Catskill region waters often have mercury levels approaching or exceeding levels of concern, generally higher than mercury levels in the same species from other regions in the State. With the regional advisories, NYS DOH seeks to simplify the advisory

message and issue protective advice for those at greatest risk, reducing the need for waterbody-specific advice. The regional advisories also provide women under age 50 and children under age 15 opportunities to eat some fish from Adirondack and Catskill waters by providing a list of less-contaminated species.

4. Game Advice

Game may also contain contaminants at levels of concern. NYS DOH issues advice about choosing and preparing game to eat, such as snapping turtles and wild waterfowl. For more information about eating game please visit [Advice on Eating Game](#).

How We Set Advisories

NYS DOH uses a risk management approach when deriving fish and game consumption advisories and updates its approach as new information become available.

Various factors are considered when reviewing fish or game information for a specific waterbody, area, or region. These factors include but are not limited to the following:

- a. A quantitative health risk assessment, based on toxicity values (e.g., from the U.S. Environmental Protection Agency Integrated Risk Information System (IRIS) toxicity database) and representative fish consumption rates, is used to evaluate risks. Average contaminant levels in the fish are typically compared to contaminant-specific guidelines or standards (including US Food and Drug Administration (US FDA) marketplace standards as available¹). See Table 1, 2, and 3 below for NYS DOH numerical guidelines for fish consumption advisory derivation for nearly all New York State waters. Note that these guidelines are updated when new information becomes available and as emerging contaminants are assessed.
- b. Data characteristics (such as number and type of samples, species, age, length, percent lipid, sample location, etc.) are evaluated to determine whether the data are adequate to represent contaminant levels in the fish and game population of interest. For example:
 - i. Because of specific characteristics (e.g., fat content, food chain position, etc.), certain fish species tend to accumulate higher levels of chemical contaminants than other fish species. It is common for different fish species from the same waterbody to have 10-fold differences in contaminant levels. By issuing species-specific advisories, NYS DOH helps anglers identify which fish species are better choices to eat. (Note: for some waters, fish contaminant levels are so high and the contamination is so pervasive that NYS DOH recommends avoiding eating all species.)
 - ii. For most contaminants, larger (older) fish are more contaminated than smaller (younger) fish of the same species. In some cases, enough information is available to issue advisories based on the length of the fish to identify better choices to eat.
- c. Temporal and spatial patterns are considered when characterizing fish contaminant levels.
- d. Populations at greater potential risk are considered, recognizing that health risks may be greater for the **sensitive populations** (women of childbearing age under 50, infants, and young children under age 15) than for the **general population** (men age 15 and over and women age 50 and over). Many chemicals that accumulate in fish and game may have a

greater effect on developing organs in a young child and in a developing fetus than in an adult. Some of these chemicals also build up in women's bodies and can be passed on to infants in mother's milk.

- e. The balance between the benefits of fishing and fish consumption versus risks of contaminant exposure are considered, bearing in mind that this balance may be different for at-risk populations versus the general population.
- f. Creating advice that is appropriate, concise, and easy to understand and remember is an important factor. For example: NYS DOH uses three basic meal categories (4 meals/month, 1 meal/month, and DON'T EAT); and a meal size of one-half pound. By stating the assumed meal size, NYS DOH gives people the option to adjust their fish consumption accordingly (e.g., they could eat 2 one-quarter pound meals instead of 1 one-half pound meal when following an advisory).
- g. Consideration is also given as to whether a water will be undergoing a change that may affect fish contaminant levels, such as sediment dredging or other contaminated-site remediation.

NYS Fish Consumption Guidelines

Among the important factors considered in the development of fish consumption advisories is the comparison of measured fish contaminant concentrations with numerical guidelines. NYS DOH has used guidelines for PCBs, mercury and other contaminants informed by human health risk, standards and guidelines from other authoritative bodies, and considered how these guidelines fit the different fish meal frequencies (Table 1). These categories (see (f) above) consider ease of communication and public understanding. Guidelines are updated when new information becomes available or new contaminants are found.

Table 1. NYS DOH Fish Consumption Numerical Guidelines for Men Age 15 and Over & Women Age 50 and Over [2,3,4,5](#)

Contaminant	Concentration range for 4 meals/month (General advisory)	Concentration range for 1 meal/month advisory	Concentration range for DON'T EAT advisory
Mercury*	<1 ppm	≥1 ppm and <2 ppm	≥2 ppm
Cadmium	<1 ppm	≥1 ppm and <2 ppm	≥2 ppm
Total PCBs*	<1ppm	≥1 ppm and <2 ppm	≥2 ppm
Total chlordane	<0.3 ppm	≥0.3 ppm and <0.9 ppm	≥0.9 ppm
Total DDT	<5 ppm	≥5 ppm and <15 ppm	≥15 ppm
Total mirex	<0.1 ppm	≥0.1 ppm and <0.3 ppm	≥0.3 ppm
Dioxin (total 2,3,7,8-TCDD Toxic Equivalents)	<10 ppt	≥10 ppt and <30 ppt	≥30 ppt
PFOS	<50 ppb	≥50 ppb and <200 ppb	≥200 ppb

* Use of these guidelines is being phased out as they are replaced with revised guidelines described in the next section.

These guidelines have been used to set advice for the general population. If there is no specific or regional advice for a waterbody, the general advice of eating up to four meals per month applies for both the general and sensitive population ((d) above) for all waters statewide. If a specific advisory is issued for the general population based on an exceedance of a contaminant guideline in Table 1, the precautionary advice for the sensitive population is DON'T EAT any fish from that waterbody. This approach has been very protective of the sensitive population but is not used by other states on shared waters and may in certain cases deprive women and children of the benefits of eating fish with low contaminant levels.

Revised Approaches

In 2021, NYS DOH applied a revised approach for PCBs with new guidelines that more closely align with advisory protocols used by other Great Lakes states and are more protective at lower concentrations (see Table 2) for both the general population and the sensitive population of women and children. These new guidelines also allow women and children to eat fish if data adequately demonstrate lower contaminant levels even though there may be a specific advisory for other species in that waterbody. This provides women and children the benefit of increased access to a healthy diet that includes low-contaminant fish.

Table 2. NYS DOH 2020 Revised Fish Consumption Numerical Guidelines for PCBs [4,5](#)

PCB concentration range (ppm)	Advisory	
	Men age 15 and over & women age 50 and over	Women under age 50 & children under age 15
<0.21 ppm	Eat up to 4 meals per month	Eat up to 4 meals per month
≥0.21 ppm - <0.5 ppm	Eat up to 4 meals per month	Eat up to 1 meal per month
≥0.5 ppm - <1 ppm	Eat up to 1 meal per month	Eat up to 1 meal per month
≥1 ppm	Don't eat	Don't eat

NYS DOH also began revising its approach for mercury to better align with guidelines used by other Great Lakes states and to be more protective at lower concentrations (see Table 3) for both the general population and the sensitive population. In 2022, starting with the Adirondack region, NYS DOH began developing new, more protective regional and waterbody-specific advice based on these updated guidelines. The new regional advice significantly reduces the number of specific advisories that anglers must navigate. Like the new PCB approach, the new mercury approach for the Adirondack Region allows women and children to eat low-mercury species from some of the most popular waters.

Table 3. NYS DOH 2021 Revised Fish Consumption Numerical Mercury Guidelines⁴

Mercury concentration range (ppm)	Advisory	
	Men age 15 and over &	Women under age 50 &

	women age 50 and over	children under age 15
<0.22 ppm*	Eat up to 4 meals per month	Eat up to 4 meals per month
≥0.22 ppm - <0.65 ppm	Eat up to 4 meals per month	Eat up to 1 meal per month
≥0.65 ppm - <0.95 ppm*	Eat up to 1 meal per month	Eat up to 1 meal per month
≥0.95 ppm - <2.0 ppm	Eat up to 1 meal per month	Don't eat
≥2.0 ppm	Don't eat	Don't eat

* 0.22 ppm and 0.95 ppm are guidelines recommended by the Great Lakes Consortium for Fish Consumption Advisories in the [Protocol for a Uniform Great Lakes Sports Fish Consumption Advisory](#).

Continued Integration of New Revised PCB and Mercury Guidelines for Advisories

The revised PCB guidelines are being applied to waterbodies with recent data of sufficient quantity and quality to use this more refined approach. This is especially appropriate for waterbodies shared with other Great Lake states, and waters with existing restrictive advice and clearly declining PCB levels. Existing waterbody, regional and statewide mercury advisories will continue to be evaluated using the new guidelines as NYS DOH strives to refine and issue advice that is more protective, easier to follow, and allows women under 50 and children under 15 to eat low-mercury fish from many popular fishing spots.

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- ¹ The US FDA marketplace standards are based on: potential health risks versus potential economic losses to the marketplace.
 - ² Guidelines used for all NYS waters with some exceptions (for example, Lake Erie and some marine waters) where a modified approach has been used.
 - ³ Advice for women under age 50 and children under age 15 is DON'T EAT any fish of any species from waters with a specific advisory (1 meal/month or DON'T EAT advisory for any fish species for men age 15 and over and women age 50 and over).
 - ⁴ Unit definitions: ppm (parts per million), ppb (parts per billion), ppt (parts per trillion).
 - ⁵ Chemical acronym definitions: PCB (polychlorinated biphenyls), DDT (dichloro-diphenyl-trichloroethane), TCDD (2,3,7,8 -tetrachlorodibenzo-p-dioxin), and PFOS (perfluorooctane sulfonate).

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