

3. How did the fish consumption advisory for Roosevelt Lake come about?

Mercury was detected at elevated concentrations in fish taken from Roosevelt Lake as a part of a study conducted by ADEQ and AGFD. Average mercury concentrations of 0.63 milligrams per kilogram (mg/kg) and 0.61 mg/kg were found in largemouth bass and channel catfish respectively. Maximum concentrations of 1.2 mg/kg (bass) and 1.1 mg/kg (channel catfish) were found. On the strength of these data, a fish consumption advisory has been issued jointly by the Arizona Department of Health Services and ADEQ.



Largemouth Bass (*Micropterus salmoides*)

Channel Catfish (*Ictalurus punctatus*)

4. How much fish is it safe to eat from Roosevelt Lake?

The advisory recommends the following consumption rates for both largemouth bass and channel catfish based on a person's age:

Children under the age of six: *No consumption*

Women of child bearing age and children between 6-16 years old: *One 8 oz fish meal (uncooked weight) per month*

All other adult women: *One 8 oz fish meal per month unless a doctor supports a higher consumption rate*

Adult men (16 years and older): *Five 8 oz fish meals per month*

5. Why is mercury considered harmful?

Mercury is a liquid metal that when consumed by living organisms is transformed to methylmercury (or "organic" mercury). While methylmercury has been linked to a variety of health effects, the primary basis for this fish advisory is its toxicity to the nervous system, including the brain. Most at risk are babies and unborn children whose mothers consume fish containing mercury prior to or during pregnancy, or while nursing. Exposure to mercury at elevated concentrations can delay walking and talking and cause learning disabilities in children. If you have questions about eating fish during pregnancy or while nursing, please contact your health care provider.

6. I've eaten fish from Roosevelt Lake in the past, am I OK?

The process for calculating risks from exposure to mercury is very conservative. Consuming the average fish from Roosevelt Lake at the rate of one 8 ounce fillet (uncooked weight) per month

is within a margin of safety for pregnant women and women of child bearing age and therefore should be even more protective for men. Methylmercury will naturally leave your body over time once exposure has stopped. This process occurs at a rate of roughly one half of the total amount in your body about every two months. If you have any questions about risks from mercury you may have consumed in the past, please contact your health care provider.

7. Where did the mercury come from?

Mercury occurs naturally in the environment and is found in small concentrations in soils throughout Arizona. Cinnabar, a natural solid form of mercury, occurs as reddish veins often in or near recent volcanic rocks. Seven of Arizona's 15 counties contain significant deposits of cinnabar with historic mining and exploration for the metal occurring in several areas, including Maricopa, Gila and Pinal counties. Mercury has also been used in many industrial and agricultural applications, placer mining and has been associated with some smokestack emissions. Mercury can enter lakes and streams from any of these sources including the atmosphere and will build up over time, especially if a waterbody is dammed and the sediments accumulate rather than flush out. It only takes a small amount of mercury in a water body to begin bioaccumulating in fish. To illustrate, one part per million (the same as one milligram per kilogram) is like one day in 2,739 years or 1/3 of a cup of water in a 20,000 gallon swimming pool. This is a concentration rarely exceeded in fish and is never seen in water samples from Arizona.

8. How did the mercury build up in the fish?

Once mercury has entered a lake or stream, it is readily taken up by bacteria found in sediments. Mercury can then build up in tissues of insects as they graze on this bacteria and when these insects are eaten by predators and these predators are, in turn, eaten by even larger predators, the mercury concentration increases every step, all the way up the "food chain" to "top predators" such as the largemouth bass. Concentrations of mercury in large, older fish can be many times those found in the insects at the bottom of the food chain.

9. Is it safe to fish in Roosevelt Lake?

Yes. Recreational fishing should not be affected by this advisory. It is safe for people of any age to handle fish in catch and release situations and as stated above, contact with the water does not pose a risk. Fishing can provide healthful outdoor family recreation. Fish are also a good source of low fat protein and as long as the fishing public does not consume bass at rates greater than those advised for Roosevelt Lake the likelihood of health risk is minimal. Eating smaller, younger fish which contain less mercury or other types of fish such as trout and bluegill can lower the amount of mercury consumed.

10. Is it safe to swim in Roosevelt Lake?

Yes. While mercury has been detected in water samples taken from Roosevelt Lake, it has always been at extremely low (parts per trillion) concentrations. Once mercury enters an aquatic ecosystem such as a lake or stream, it is quickly accumulated in the muscle tissue of living organisms such as aquatic insects and fish where it primarily remains, moving from organism to organism. Thus, in aquatic ecosystems, the vast majority of the mercury is most likely contained in the organisms inhabiting that system, leaving only very small amounts in the water. Swimming or taking part in other recreation in and around the water does not present a human

health hazard due to mercury.

11. Is this just an Arizona problem?

Public consumption advisories regarding mercury are common throughout the United States and Canada. At least 48 states and a number of tribes have issued mercury advisories as of 2008. With this advisory for Roosevelt Lake, Arizona currently has 13 lakes with mercury advisories. Also, in January, 2001, the USEPA and the FDA jointly issued a fish advisory covering both commercially and recreationally caught fish, advising women who are pregnant or who may become pregnant, to limit consumption of all fish to one 8 ounce fillet (uncooked weight) per week. More information, and the text of this advisory can be found at:

<http://www.epa.gov/mercury/advisories.htm>

For more information on other fish consumption advisories in Arizona, please see:

<http://www.azdeq.gov/enviro/water/assessment/download/fish0305.pdf>
http://www.gf.state.az.us/h_f/fish_consumption.shtml