



Join the Global Effort to Understand Mercury Contamination in Seafood*

Understanding the Role of Bioindicators

The world's oceans and waterways are key sources of mercury found in fish and wildlife. Understanding mercury exposure provides critical information on environmental impacts and potential risks related to human and ecological health. While young fish can reflect rapid changes of environmental mercury loads, long-lived predatory fish may indicate concern for human health.

Risks to Human Health

Consumption of seafood is the primary pathway for methylmercury exposure in humans. Methylmercury, the organic and more toxic form of mercury, is known to affect neurological development in children and is also linked to cardiovascular disease in adults. Many potential food items, especially certain fish and marine mammals species, may contain mercury concentrations that exceed safe levels for human consumption. This is of particular importance to vulnerable populations including children, pregnant women, and indigenous communities that rely on seafood as a major protein source.

**Seafood includes marine and freshwater fish and shellfish, as well as marine mammals.*

Why Should Your Country Participate?

- Build capacity in your country to comply with biomonitoring efforts as outlined in Article 19 of the Minamata Convention on Mercury, which lists those organisms that should be monitored including fish, sea turtles, birds, and marine mammals.
- Include your country-specific data in a global database on mercury content of seafood and freshwater fish. By participating in this effort, your country's data will help toward understanding the global scope of mercury contamination in our food sources.
- Position your country for Next Steps in the global effort to monitor exposure to mercury (see back page).

Who Should Be Concerned?

- Ministries where there are vulnerable populations.
- General public and regular consumers of seafood.
- Environmental and wildlife conservation groups (e.g., the International Union for Conservation of Nature).

Quick Notes

- **Focal taxa—marine:**
Barracuda, billfish, bluefish, cod, flounder, groupers, haddock, halibut, mahi mahi, mackerel, mullet, salmon, sharks, snapper, swordfish, tuna
- **Focal taxa—freshwater:**
Arctic char, bass, catfish, perch, pike, trout, and walleye
- **Collaborative projects:**
BRI partnered with IPEN on *The Global Fish and Community Mercury Monitoring Project*, the first study of its kind, sampling fish from 29 countries to identify biological mercury hotspots around the world.

Learn How You Can Participate

Details about how you can participate are on the reverse side of this flyer.



2) What Does BRI Do?

Once biotic samples are safely shipped to BRI, we prepare and analyze them, and provide interpretation.



3) What Do You Receive?

Mercury data from biota will provide a clearer understanding of human and ecological health.



Fish and Other Biota Sampling Process

1) What Do You Provide to Us?

Country Ministries and NGOs work with BRI biologists to properly identify and collect biotic samples.



Biomonitoring helps meet the objectives of **Article 19** of the Minamata Convention on Mercury.

Next Steps: Become a Partner in Global Mercury Biomonitoring

Biomonitoring is the process of assessing the health of organisms and ecosystems, tracking changes over time. If you are interested in joining the global mercury biomonitoring effort, please consider the following steps:

- Contact **Biodiversity Research Institute (BRI)**. We will provide guidance and protocols on all aspects of the process.
- Develop partnerships among and within your country's Ministries and local nongovernmental organizations.
- Determine your goals and objectives, which BRI can then help to connect to the Minamata Convention.
- Identify funding sources to cover expenses (e.g., field sampling, shipping, lab analysis, reports).
- Identify where, what, when, and how to conduct field sampling.
- Conduct sampling; ship samples to BRI.
- BRI will analyze samples and interpret data.
- Submit report to country Ministry.

To join this effort, please contact:

David Evers, Ph.D.

Executive Director/Chief Scientist
Biodiversity Research Institute
david.evers@briloon.org

BRI Science Communications



BRI's publications help advance environmental awareness and inform decision makers about the research we conduct. For example:

Local, Regional, and Global Biomonitoring: Understanding Mercury Exposure through Monitoring At-risk Species. 2017



Available online: www.briloon.org/hgpubs

Additional Resources



IPEN is a global network of people and organizations committed to a toxic-free environment:
www.ipen.org



List of Alternatives to Mercury-added Products (to be available in 2018): www.unep.org



Basel Convention Regional Centers: www.basel.int

Related Web Links

Minamata Convention on Mercury:
www.mercuryconvention.org

United Nations Development Programme:
www.undp.org

United Nations Environment:
www.unep.org/chemicalsandwaste

United Nations Industrial Development Organization: www.unido.org

World Health Organization: www.who.int



BIODIVERSITY RESEARCH INSTITUTE
www.briloon.org/hgcenter

Global Health Trade-Off for Mercury and Omega-3 in Seafood

Milligrams of Omega-3 Fatty Acids/4 Ounces of Cooked Fish →

MEAL FREQUENCY RECOMMENDATIONS	<500 mg	500-1,000 mg	1,000-2,000 mg	> 2,000 mg
Unrestricted meals (< 0.05 µg/g)	Catfish, Clams, Crab* (most species), Croaker, Haddock, Scallops, Shrimp, Tilapia*	Blue Mussels,* Pink Salmon, Sockeye Salmon	Chinook Salmon,* Coho Salmon, Oysters	Healthier Choices Atlantic Salmon, Sardines, Shad
1-2 meals per week (0.05-0.22 µg/g)	Atlantic and Pacific Cod, Flounder, Grenadier, Hake, Lobster,* Scad, Seabream, Sole	Atlantic Pollock, Mahi Mahi, Mullet, Scad, Squid, Skipjack Tuna, any canned tuna	Atlantic Horse Mackerel, European Sea Bass, Rays, Skates, Trout	Anchovies,* Herring
1 meal per month (0.22-0.95 µg/g)	Grouper, Orange Roughy, Snapper	Amberjack, Barracuda, Bigeye Tuna, Bluefish, Halibut, Jack, Trevally, Yellowfin Tuna, Wahoo	Atlantic and Pacific Mackerel, Albacore Tuna,* Atlantic Bluefin Tuna, Chilean Sea Bass	<p>Mercury concentrations vary widely across shark species. To learn more, visit: www.briloon.org/hgcenter</p>
No consumption (> 0.95 µg/g)	King Mackerel Riskier Choices	Marlin, Sailfish, Tilefish	Dogfish, Ground, and Mackerel Sharks; Pacific Bluefin Tuna, Swordfish*	

Data Sources: BRI's Global Biotic Mercury Synthesis (GBMS) Database; U.S. Environmental Protection Agency; U.S. Food and Drug Administration

*Pictured