

SEAFOOD



Quick Notes

➤ Collaborative Projects

Biodiversity Research Institute (BRI) partnered with Basel Convention Regional Centre-Caribbean (BCRC-Caribbean) on the project *Fish Mercury Biomonitoring in the Caribbean Region*. Fish and marine invertebrates were sampled from six countries, including Saint Lucia, to help provide important information to fishermen and consumers about the potential risks of mercury exposure associated with human consumption of seafood.

➤ Consumption Guidelines

Meal frequency guidelines by the *Great Lakes Fish Advisory Workgroup* are based on the U.S. EPA reference dose of 1×10^{-4} mg of Hg/kg of body weight/day, a body weight of 132 pounds (60 kg) for an adult female person, and a fish meal size of about 6 ounces (170 grams).



Saint Lucia

Why Use Fish as Bioindicators?

The world's oceans and waterways are key sources of mercury (Hg) found in fish and wildlife. A variety of species are used as bioindicators to provide important information on the impacts of mercury pollution and potential risks related to human health. For example, young fish can reflect rapid changes of environmental mercury loads; long-lived predatory fish may indicate concern for human health.

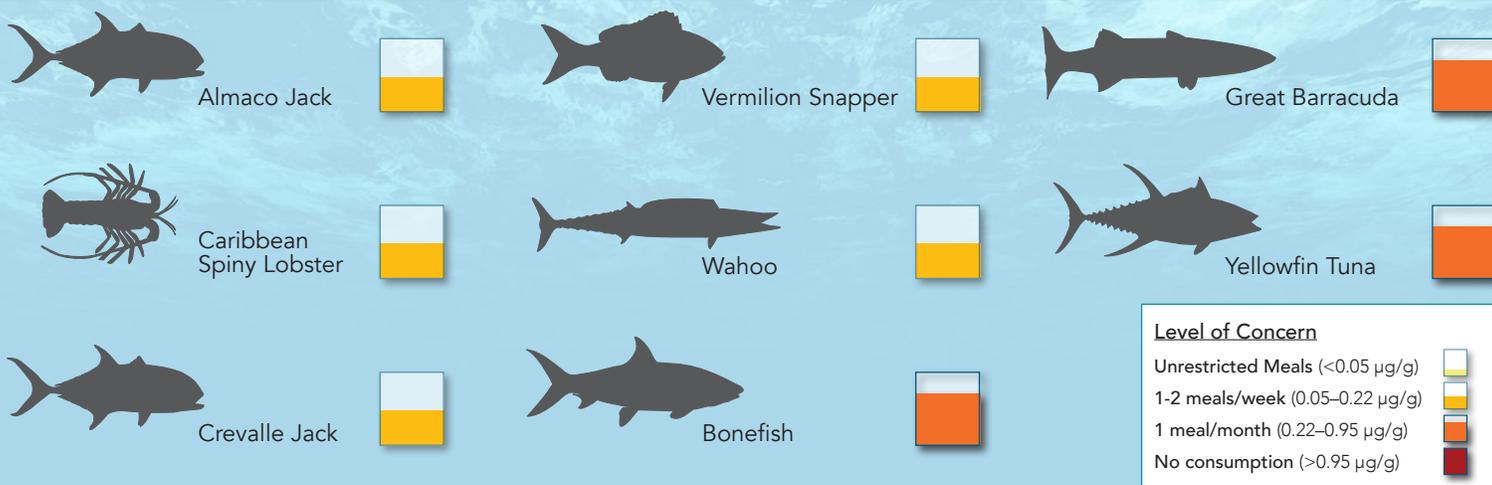
What are the Risks to Human Health?

Frequent consumption of certain types of seafood* is the primary pathway for methylmercury (MeHg) exposure

in humans. Continuous exposure to MeHg, 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.

Some larger species of fish and marine mammals 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, shellfish, and marine mammals.



Level of Concern

- Unrestricted Meals (<0.05 µg/g)
- 1-2 meals/week (0.05–0.22 µg/g)
- 1 meal/month (0.22–0.95 µg/g)
- No consumption (>0.95 µg/g)

Figure 1. Level of concern for mercury in seafood commonly consumed in Saint Lucia (based on global Hg averages, which may differ from local Hg concentrations). The infographic may not match all focal species samples for Hg. Consumption thresholds are determined by the Great Lakes Fish Advisory Workgroup.

Mercury Biomonitoring in Saint Lucia

Biomonitoring is the process of assessing the health of organisms and ecosystems and tracking changes over time.

1. Saint Lucia sent BRI 31 muscle samples from eight different species of fish consumed locally.
2. Samples were analyzed for total mercury (THg) at BRI's Wildlife Toxicology Lab and results were compiled into a report submitted to government representatives.
3. THg concentrations in seafood from Saint Lucia are considered low. Eighty-four percent of samples analyzed had concentrations below the WHO guidelines¹ for human consumption.
4. THg concentrations varied between species along a trophic level gradient. Predatory fish (e.g., great barracuda) have higher mean THg concentrations than lower trophic level species (e.g., Caribbean spiny lobster).
5. There were no significant differences in mean THg concentrations between locations in Saint Lucia where samples were obtained.
6. **Next steps:** A more detailed assessment of THg concentrations in commonly consumed species in

Saint Lucia would help to provide important information to fisherman and consumers about the risks associated with consuming different species.

¹ Codex Alimentarius. 2009. *Codex General Standard for Contaminants and Toxins in Food and Feed (Codex Stan 193-1995)*. United Nations Food and Agriculture Organization, 44 pp. (available online at: http://www.fao.org/fileadmin/user_upload/livestockgov/documents/1_CXS_193e.pdf)

Benefits of Biomonitoring in Saint Lucia

- Biomonitoring efforts build Saint Lucia's capacity for complying with the Minamata Convention on Mercury, which in Article 19 states that "Parties shall endeavour to cooperate to develop and improve... monitoring of levels of mercury and mercury compounds in... fish, marine mammals, sea turtles and birds..."
- Biomonitoring provides information on spatial patterns of mercury exposure in Saint Lucia, including the ability to identify any areas of high exposure representing a risk to human or ecological health.
- Saint Lucia's country specific data was included in a global database of mercury content in seafood and freshwater fish. These additional data will help with understanding the global scope of mercury contamination in food sources.
- The relevant government entities in Saint Lucia were informed of exposure risks from the frequent consumption of seafood by the general public and regular consumers (including vulnerable populations) of seafood. Fish consumption is the primary pathway for mercury exposure in humans.



BRI Science Communications

BRI's publications help advance environmental awareness and inform decision makers. For example:

Local, Regional, and Global Biomonitoring:
Updated 2018



Available online: www.briloon.org/hgpubs

Additional Resources



A global network committed to a toxic-free environment:
www.ipen.org



List of Alternatives to Mercury-added Products (available in 2019):
www.unep.org

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