

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

Blue highlights - seafood important for the Caribbean region. Blue underline - seafood that has been sampled in Dominica.



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Basel Convention Regional Centre for
Training and Technology Transfer for
the Caribbean Region

Swiss Confederation

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

↓ Total Mercury in Muscle Tissue µg/g (www)

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

¹ White canned tuna can be albacore or yellowfin.

Mercury and Omega-3

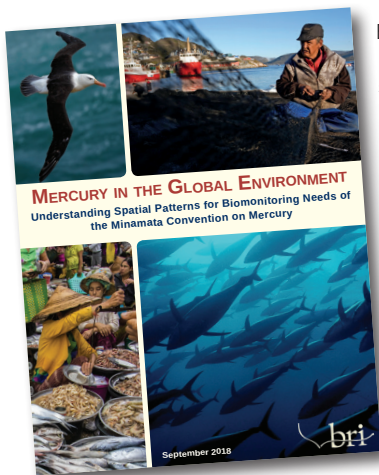
This seafood matrix illustrates the interactions between the health risks posed by mercury concentrations and the health benefits of omega-3 fatty acids. Those species or groups with low mercury levels and high omega-3 fatty acids offer the healthiest options, while those with elevated mercury body burdens and low omega-3 fatty acids are riskier and less nutritious choices.

Healthier Fish Choices

Globally, mercury concentrations are lowest in smaller, short-lived fish. There are many regularly harvested fish such as anchovies, sardines, flounder, cod, salmon, and haddock that can be safely consumed on a weekly basis.

Riskier Fish Choices

Mercury concentrations are highest in large, long-lived species, many of which are pelagic. Marlin, Pacific bluefin tuna, swordfish, and king mackerel have the highest mercury concentrations of any fish in BRI's Global Biotic Mercury Synthesis (GBMS) Database. Generally, mercury concentrations in sharks exceed safe consumption guidelines.



BRI's **Center for Mercury Studies** is engaged in projects and initiatives that range from the global-scale monitoring of mercury in aquatic ecosystems to detailed monitoring of mercury exposure in single species and at-risk populations.

For more information or to download BRI's new publication *Mercury in the Global Environment*, visit:

www.briloon.org/hgcenter



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Interpreting Mercury Concentrations and Risks of Exposure

Seafood methylmercury concentrations and associated consumption guidelines	
Mercury in Seafood (ppm, ww)	Consumption Guidance
≤ 0.05	unrestricted
0.05-0.11	2 meals per week
0.11-0.22	1 meal per week
0.22-0.95	1 meal per month
> 0.95	no consumption

Meal frequency guidelines 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).

These guidelines could also be used for muscle tissues in marine mammals because > 95% of mercury is in the methyl form. However, shellfish mercury concentrations greatly vary in percent methyl and therefore the consumption guidance provided here cannot be directly used with shellfish mercury data provided herein.

Biodiversity Research Institute's mission is to assess emerging threats to wildlife and ecosystems through collaborative research and to use scientific findings to advance environmental awareness and inform decision makers.