Researchers find major gaps in understanding risks, benefits of eating fish

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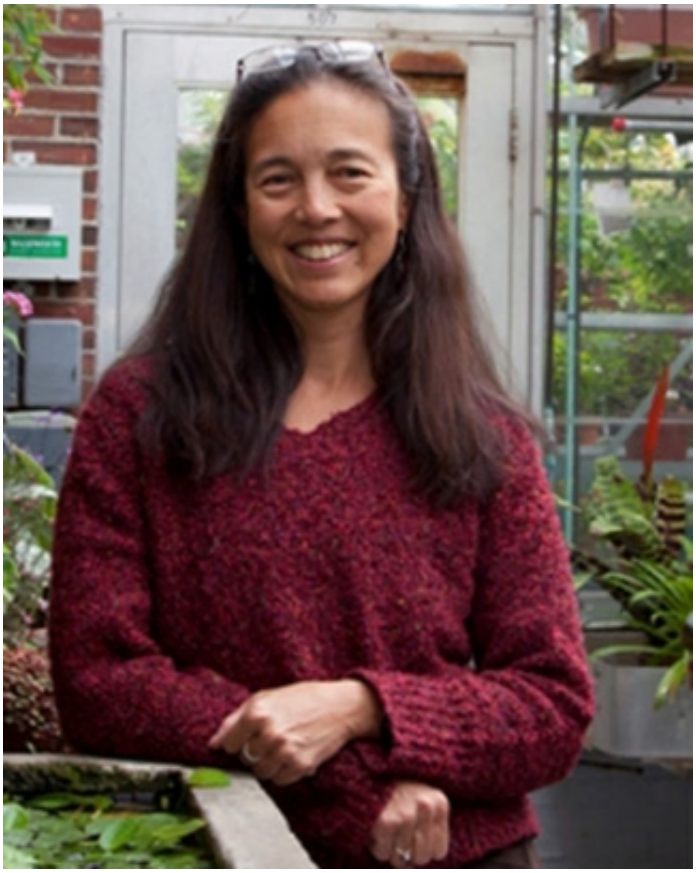

Dartmouth Research Professor Celia Chen and her collaborators have found that fish tissue is rarely measured for concentrations of both harmful contaminants and healthful nutrients across a range of species and geographic regions. Credit: Dartmouth College

Fish tissue is rarely measured for concentrations of both harmful

contaminants and healthful nutrients across a range of species and geographic regions, say a Dartmouth researcher and her colleagues who reviewed the risks and benefits of eating seafood.

Calling this a "major scientific gap," the researchers say that interpreting the implications of seafood for human health will require a better understanding of these multiple exposures, particularly as environmental conditions in the oceans change.

The findings appear in the *Journal of the Marine Biology Association of the United Kingdom*.

"The novelty of this paper is its broad scope, which includes human health outcomes and marine science as well as the discussion of both the risks and benefits of fish consumption," says senior author Celia Chen, a research professor of biological sciences and a project leader in Dartmouth's Toxic Metals Superfund Research Program.

The world's fish species are harvested in oceans, coastal waters and estuaries, where environmental and ecological conditions determine their exposure to healthful nutrients and harmful contaminants, which are passed on to humans who eat them. In the next decade, total global production from wild fisheries and aquaculture is expected to exceed production of beef, pork or poultry.

In their study, the researchers focused on human exposure to combinations of fish oils, selenium and mercury, particularly its highly toxic form, methylmercury. They reviewed data from 10 studies involving 63 fish species over two decades. The new results showed that our ability to estimate the risks and benefits of seafood consumption is hampered by the common practice of separately studying contaminants or nutrients in fish. Also, there is tremendous variability between and within fish species in their mercury and fatty acid concentrations,

complicating the interpretation of epidemiological studies on seafood health implications. The authors conclude that future assessments will require greater understanding of exposures to both fish contaminants and nutrients as well as the environmental and ecological drivers that control uptake of contaminants and nutrients in marine food webs.

"The factors affecting marine fish may be altered by climate change impacts such as ocean warming and acidification, by increases in precipitation and nutrient loading and by changes in contaminant sources," Chen says. "Together, these changes indicate a need for continued research on fish nutrients and contaminants in marine and biomedical science as well as ongoing communication between these disciplines."

More information: Mercury, selenium and fish oils in marine food webs and implications for human health, DOI: 10.1017/S0025315415001356

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