

Scientists find that Fukushima-derived radioactivity in seafood poses minimal health risk

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Migration track of a tagged Pacific Bluefin Tuna.

(Phys.org) —In 2012, Nicholas Fisher a distinguished professor in the School of Marine and Atmospheric Sciences (SoMAS) at Stony Brook University and postdoctoral scholar Zosia Baumann, working with a colleague at Stanford University's Hopkins Marine Station, reported that they had detected radioactivity in Pacific bluefin tuna swimming off the California coast. The source of the radioactivity was Japan's Fukushima Dai-ichi powerplants, which were damaged by the strong earthquake and subsequent tsunami on 11 March 2011 and released large quantities of radioactivity into the Pacific Ocean. The news prompted widespread

media interest and speculation as to the possible risks to seafood consumers posed by the levels of radioactivity found in the tuna.

Now, Fisher, Baumann and colleagues at Stanford and the French Institute for Radiological Protection and Nuclear Safety (IRSN) report in a paper entitled " Evaluation of [Radiation Doses](#) and Associated Risk from the Fukushima [Nuclear Accident](#) to Marine Biota and Human Consumers of Seafood," published in the *Proceedings of the National Academy of Sciences* of the US, that the likely doses of radioactivity ingested by humans consuming the contaminated fish, even in large quantities, is comparable to, or less than, the radiological dosages associated with other commonly consumed foods, many medical treatments, air travel and other background sources. The authors also conclude that contamination of Pacific bluefin tuna and other [marine animals](#) from Fukushima poses little risk to these animals.

Fisher and colleagues found that the sampled tuna contained elevated levels of [radioactive cesium](#)-134 and cesium-137, important components of the radionuclide mix released at Fukushima. Pacific bluefin tuna spawn in the western Pacific off Japan and reach the eastern Pacific, off the California coast, after a transoceanic migration.

In the original paper, the authors presented data on the radionuclide concentrations in the tissues of the bluefin, but did not estimate doses or health risks to marine biota or human seafood consumers that these concentrations might represent. The new works takes this next step.

The levels of Fukushima-derived radionuclides in marine biota, including [Pacific bluefin tuna](#), were compared with the radiation doses from naturally-occurring radionuclides in the same organisms. The principal radionuclide found in all samples is polonium (specifically the isotope ^{210}Po), a naturally-occurring isotope that is an alpha-emitter, which causes greater biological damage.

"For American and Japanese seafood consumers, the doses attributable to Fukushima-derived radiation were typically 600 and 40 times lower, respectively, than the dose from polonium," said Professor Fisher. "In estimating human doses of the [Fukushima](#)-derived radioactive cesium in Bluefin tuna, we found that heavy seafood consumers – those who ingest 124 kg/year, or 273 lbs., which is five times the US national average – even if they ate nothing but the Cs-contaminated bluefin [tuna](#) off California, would receive radiation doses approximately equivalent to that from one dental x-ray and about half that received by the average person over the course of a normal day from a variety of natural and human sources. The resulting increased incidence of cancers would be expected to be essentially undetectable."

More information: www.pnas.org/content/early/2013/06/03/10110.834110.full.pdf+html

Provided by Stony Brook University

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