

# Experts recommend a varied and moderate consumption of sushi limiting quantities of tuna

July 8 2021

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A research group from the URV and the Pere Virgili Health Research Institute have analyzed the concentration of various toxic elements in

sushi and evaluated the risk of consuming them in infant, adolescent and adult populations.

Eight pieces of salmon-based maki, nigiri or sashimi or maki unagi (eel) is the safest combination of [sushi](#) for adult and adolescent populations. That is one of the findings of TecnATox (Centre for Environmental, Food and Toxicological Technology), a joint research group from the URV and the Pere Virgili Health Research Institute (IISPV), which has analyzed the presence of arsenic and various heavy metals in sushi. The consumption of sushi has increased significantly since the start of the 21st century, as has the number of restaurants offering it throughout the region. Although eating fish is recommended because of its high nutritional value, it can also lead to exposure to contaminants, such as heavy metals. Likewise, rice is a [food](#) that provides many nutrients and fiber and is low in fat, but it too can be source of pollutants such as arsenic.

The research group analyzed the concentrations of various toxic elements (cadmium, nickel, lead, mercury, inorganic arsenic and methylmercury) and iodine in a hundred pieces of sushi, specifically those known as sashimi (raw fish), maki (a seaweed roll stuffed with rice, raw fish or other ingredients) an nigiri (balls of rice with fish or seafood on top). The researchers also calculated dietary exposure to all of these contaminants in various population groups (infants, adolescents and adults) and evaluated the risks to health.

The main results show a significantly higher concentration of [inorganic arsenic](#) in maki and nigiri, compared to sashimi, a finding associated with the presence of rice. They also show higher levels of mercury and methylmercury in sushi that contains tuna due to the bioaccumulation and biomagnification of this metal.

The research group also wanted to determine how consumption of this

foodstuff varied in different groups of the population. They examined an average intake of 8 pieces of sushi in adults and adolescents and an average intake of 3 pieces in infants and found an increase in exposure to nickel and lead, although this remained within safe established levels. "The most worrying finding concerns methylmercury, a highly neurotoxic compound, for which there was an estimated exposure of 0.242  $\mu\text{g}$  per kg of bodyweight in adolescents, a value higher than the safe daily limit established by the European Food Safety Authority (EFSA)," explained Montse Marquès, one of the researchers who worked on the study. By the same token, although not as high as in adolescents, the exposure levels calculated for adults and infants also suggest a relatively high intake of methylmercury.

Finally, the results were analyzed as a whole to determine which combinations of sushi do not represent a risk. "We recommend that people combine 8 pieces of salmon-based maki, nigiri or sashimi or maki containing unagi (eel) and limit their consumption of any type of sushi containing tuna," warned Marquès.

The researchers stressed that the amounts of sushi analyzed constitute only one of the five recommended meals a day. This means that the consumption of other foods throughout the day may also lead to exposure to certain toxic elements, such as arsenic (present in rice and rice-based foods), mercury (present in tuna and swordfish) or nickel (present in vegetables, pulses and cereals).

Due to its nutritional benefits, the researchers still recommend the consumption of sushi, but they also stress the need to do so in moderation in order to minimize the intake of certain food toxins.

**More information:** Neus González et al, Dietary exposure to potentially toxic elements through sushi consumption in Catalonia, Spain, *Food and Chemical Toxicology* (2021). [DOI:](#)

[10.1016/j.fct.2021.112285](https://doi.org/10.1016/j.fct.2021.112285)

Provided by Universitat Rovira i Virgili

Citation: Experts recommend a varied and moderate consumption of sushi limiting quantities of tuna (2021, July 8) retrieved 8 May 2024 from <https://medicalxpress.com/news/2021-07-experts-varied-moderate-consumption-sushi.html>

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