

How safe is your sushi? Some bacteria can pose a risk

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Sushi is generally safe to eat, but some bacteria in sushi, sashimi and cold-smoked fish products can pose a risk to people who eat such foods frequently, especially people with weak immune systems, children and the elderly. Credit: Idun Haugan, Norwegian University of Science and Technology

Sushi has become everyday fare in Norway and elsewhere around the globe, and many people opt for sashimi and other raw fish when they want to treat themselves to something tasty.

It is important to emphasize here that, as a general rule, it is completely safe to eat this type of food in Norway. However, despite the fact that sushi can be delicious, it also carries a [health hazard](#), both for individuals and for society at large.

"Bacteria in sushi, sashimi and cold-smoked fish products can pose a risk to people who eat such foods frequently, especially people with weak immune systems, children and the elderly," says Hyejeong Lee.

She recently completed her Ph.D. at the Department of Biotechnology and Food Science at NTNU. In her thesis, she investigated different varieties of *Aeromonas* bacteria in [seafood products](#) that do not undergo extensive processing. Without [heat treatment](#) or the use of other antibacterial methods, the risk of bacteria levels becoming high increases sharply. The study has been published in *Frontiers in Microbiology*.

"The goal was to gain more knowledge about *Aeromonas* in this type of seafood—both the bacteria's role in the deterioration of the product and in causing disease. Furthermore, we wanted to see if raw seafood can spread [antibiotic-resistant bacteria](#)," says Dr. Lee.

Listeria monocytogenes is probably the best-known pathogenic bacteria related to raw or mildly processed seafood. However, the prevalence of *Aeromonas* in these kinds of products has worried scientists for some time.

Limited processing does not inhibit bacterial growth

Lee's point of departure was fish products that are readily available on the Norwegian market. She checked these products for *Aeromonas* bacteria.

"The results show that the mild processing these fish products receive does not guarantee that the growth of *Aeromonas* bacteria will be inhibited," says Lee.

In other words, the processing of sushi, sashimi and cold-smoked fish is ineffective in preventing bacterial growth. But that's not all.

"The majority of these *Aeromonas* variants are possibly pathogenic and there are often several different risk factors associated with them," says Lee.

Lee emphasizes that the risk of getting sick from *Aeromonas* is admittedly very small, especially for healthy people.

"*Aeromonas* is often ignored when we talk about food safety. I think my research highlights that the [food industry](#) needs to pay more attention to these bacteria," says Lee.

Can spread antibiotic resistance

It is, of course, not very nice for the individuals who become sick, but

looking at the big picture, another factor is even more important.

Aeromonas bacteria in the sea frequently exchange genetic material with other bacteria. This is especially unfortunate if this [genetic material](#) comes from bacteria that are resistant to antibiotics.

"Some strains of Aeromonas can also spread [antibiotic resistance](#) from one type of bacteria to another. Eating seafood infected by resistant bacteria is a likely way these bacteria can spread from [marine animals](#) and environments to humans," Lee concludes.

Resistant bacteria are a growing problem around the world. Resistant bacteria do not cause more disease than other bacteria, but they are far more difficult to treat, because not all types of antibiotics work against them. In a [worst case scenario](#), no antibiotics work at all.

Combating the spread

"To combat the spread of antibiotic-resistant bacteria, it is important that we adopt a broad approach that looks at animal and human health, food production and the environment together in order to achieve better public health," says Anita Nordeng Jakobsen, associate professor at NTNU's Department of Biotechnology and Food Science.

The associate professor points out that microorganisms are transferred between animals and humans via food and the environment, so reduced use of antibiotics alone is not enough to prevent bacterial proliferation.

Preventative methods include systematically monitoring and taking samples in production environments, finding good monitoring indicators, implementing measures when multi-drug-resistant bacteria are detected in groups of animals, vaccination, as well as education and awareness-raising work in food production around the world.

Strict regulation by the authorities is probably the most important means of tackling the problem of antibiotic-resistant [bacteria](#). However, individuals can make a difference by choosing raw produce from countries that only use small amounts of antibiotics in aquaculture, such as Norway.

Norway is among the best in the world when it comes to restrictive use of antibiotics both in the aquaculture industry and in livestock farming. However, preventive or growth-promoting use of antibiotics is common in other parts of the world, especially Southeast Asia.

More information: Hye-Jeong Lee et al, Whole genome sequence analysis of *Aeromonas* spp. isolated from ready-to-eat seafood: antimicrobial resistance and virulence factors, *Frontiers in Microbiology* (2023). [DOI: 10.3389/fmicb.2023.1175304](https://doi.org/10.3389/fmicb.2023.1175304)

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