

# Omega-3 fatty acids can neutralize listeria

May 23 2017, by Birgitte Svennevig

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Certain fatty acids are not only part of a healthy diet—they can also neutralise the harmful listeria bacterium, a new study shows. This discovery could eventually lead to improved methods to combat dangerous and drug-resistant bacteria.

It's every consumer's nightmare—bringing home food from the supermarket that turns out to be teeming with hazardous [bacteria](#); [listeria](#) in the sausages, or salmonella in the pork, for example.

Professor Birgitte Kallipolitis conducts research into dangerous bacteria at University of Southern Denmark and has led a new study that provides some surprising insights into the inner workings of the listeria bacterium. It's a discovery that can help her and other researchers in their work to reduce the risk of dangerous bacteria in our foods.

"Our study has shown that common, naturally occurring [fatty acids](#) can switch off the specific genes that make the listeria bacterium dangerous. We tested omega-3 fatty acids, and it took them about half an hour to neutralise the [listeria bacteria](#)," says Kallipolitis.

## Healthy fatty acids as medicine

She and her research group at the Department of Biochemistry and Molecular Biology are running several studies to try to understand exactly what happens at the molecular level when fatty acids and listeria encounter each other.

"It's interesting that naturally occurring, completely harmless and actually healthy fatty acids can be used to suppress dangerous bacteria such as listeria. The long-term perspective is that it may prove possible to develop new treatment methods—not only against listeria, but also against other dangerous bacteria that are currently resistant to antibiotics," she said.

Researchers have long known that high concentrations of certain fatty acids may have an antimicrobial effect and can kill [dangerous bacteria](#) such as listeria and salmonella.

## **Destroying the capacity to cause disease**

- "Now we have discovered that something happens at even low concentrations of fatty acids, and that this is something entirely different," she says.

During the study, researchers observed that low concentrations of [omega-3 fatty acids](#) do not kill listeria bacteria. Instead, the specific genes responsible for their virulence were switched off.

"Our theory is that the fatty acids do something to the PrfA protein so that it cannot switch on the virulence genes, and we're very interested in finding out what exactly is occurring."

## **Allowing the bacterium to survive is a better strategy**

At first glance, it can sound a little troubling that the bacteria are not killed but are instead only rendered harmless and therefore remain alive. But this is actually an advantage.

"When the growth of the bacterium is not threatened, it does not begin to

develop new survival strategies that may make it resistant to attack. Bacteria can develop resistance to attacks, and we have many examples of how this merely creates new and even bigger problems for combating them. It might be a better strategy to let them live and instead aim to neutralise their capacity to cause disease," says Birgitte Kallipolitis.

A [listeria infection](#) can cause listeriosis, which can be a life-threatening illness. The researchers have published their study in the journal *Research in Microbiology*.

**More information:** Eva Maria Sternkopf Lillebæk et al. Antimicrobial medium- and long-chain free fatty acids prevent PrfA-dependent activation of virulence genes in *Listeria monocytogenes*, *Research in Microbiology* (2017). [DOI: 10.1016/j.resmic.2017.03.002](https://doi.org/10.1016/j.resmic.2017.03.002)

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