

Researchers make oysters safer to eat with improved purification method

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Researcher Yi-Cheng Su pulls an oyster from a deputation tank at Oregon State University's Seafood Laboratory in Astoria. As the oysters filter the water, they excrete harmful bacteria from their digestive tracts and become safe to eat. Credit: Lynn Ketchum

(Phys.org) —Oregon State University has improved an old method of making oysters safer to eat so that more bacteria are removed without sacrificing taste and texture.

The improved process nearly clears their digestive tracts of the bacteria *Vibrio parahaemolyticus*, which can cause gastroenteritis, an infection

marked by severe abdominal pain, vomiting and diarrhea. Each year in the United States, more than 40,000 cases of *Vibrio parahaemolyticus* infection are linked to the consumption of seafood, particularly [raw oysters](#), according to the [Centers for Disease Control and Prevention](#).

"This bacteria is a huge safety concern," said Yi-Cheng Su, an OSU professor of seafood microbiology and safety. "Cooking [oysters](#) easily kills it, but many consumers want to eat raw shellfish without worrying about foodborne illness. Oysters are also worth more to the [seafood industry](#) when alive."

To make oysters safer, processors freeze, heat up or pressurize the [mollusks](#). They also place them in tanks of clean seawater at room temperature. In the latter case, which is known as deputation, the shellfish filter clean water through their system and excrete most bacteria from their digestive tracts into the water. The dirty water is then filtered and sterilized with UV light.

But deputation at ambient temperature is not fully effective, researchers say. More than 10 percent of the *Vibrio* bacteria still remain after two days of deputation.

Pressurization, freezing and [heat treatment](#) kill all the *Vibrio* bacteria but they also kill the shellfish. Additionally, freezing and heat treatment negatively affect their taste, texture, shelf life and value.

Seeking a better alternative, Su and his colleagues tweaked the deputation method. They chilled the water to between 45 and 55 degrees and sterilized it with ultraviolet light. Their method eliminated 99.9 percent of the bacteria after four to five days. The oysters stayed alive during the purification, and their texture and taste were not altered. The new deputation process is also more cost-effective, Su said.

"Temperature-controlled depuration uses less electricity than other methods that rely on freezers, heat, pressurization and even radiation," he said. "Depuration systems are also relatively cheap to build – just a few shellfish holding tanks each equipped with a water pump, a UV sterilizer and a temperature control device."

The oysters still need to be placed in cold storage after the depuration process because warm environments allow any remaining [bacteria](#) to multiply quickly, nullifying the depuration process.

OSU researchers are also exploring ways to speed up the low-temperature depuration process by adding antimicrobial agents to the [seawater](#) in the tanks.

Oregon producers sold \$3 million of farmed oysters in 2011, according to a report by the OSU Extension Service.

Provided by Oregon State University

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