

Dangerous Raw Oysters

[Announcer] This program is presented by the Centers for Disease Control and Prevention.

[Reginald Tucker] Hello, I'm Reginald Tucker, and today I'm talking with Dr. Duc Vugia, chief of the Infectious Diseases Branch at the California Department of Public Health. Our conversation is based on his study about California regulations on eating raw oysters, which appears in CDC's journal, *Emerging Infectious Diseases*. Welcome, Dr. Vugia.

[Duc Vugia] Thank you, Reginald.

[Reginald Tucker] Dr. Vugia, is it dangerous to eat raw oysters?

[Duc Vugia] For most people, eating raw oysters carries only a small risk of mild illness. But for others, the consequences can be dangerous and even deadly. It's important to know why eating raw oysters can be dangerous, and most importantly, if you are at greater risk for infection from eating them.

Eating raw oysters is dangerous for certain groups of people because some raw oysters contain bacteria or viruses that can cause disease. A bacterium called *Vibrio vulnificus* that is in some oysters can cause severe illness and death in people with certain underlying medical conditions. The problem is that there is no way to tell the difference between a contaminated oyster and one that is not contaminated.

[Reginald Tucker] How do oysters become contaminated with *Vibrio vulnificus* bacteria?

[Duc Vugia] Well, *Vibrio* bacteria exist naturally in marine waters and estuaries all over the world. Oysters and other shellfish are filter feeders, and they accumulate these bacteria as they filter water. *Vibrio* bacteria also multiply when water gets warmer, and therefore oysters harvested from warm waters, such as the Gulf of Mexico during the warmer months, often have high levels of these bacteria.

[Reginald Tucker] Is eating raw oysters really a serious issue for anyone eating them or is it an issue only for people who are sick anyway?

[Duc Vugia] Raw oysters that contain bacteria or viruses can cause illness in anyone. For healthy people, the illness typically consists of vomiting, diarrhea, and abdominal cramps for a few days.

But, to answer your question, yes, the illness may be more severe for people with an underlying medical condition. This is especially true if the bacteria in the oysters are *Vibrio vulnificus*. In people with liver disease, diabetes, or a weakened immune system, the *Vibrio vulnificus* bacteria can invade the bloodstream, causing shock and sometimes death.

[Reginald Tucker] Is any particular population affected by eating raw oysters more than any other one?

[Duc Vugia] Yes, raw oyster-associated infections affect people with certain medical conditions more than healthy people. People with liver disease of any type, including alcoholic liver disease; a weakened immune system, such as from cancer treatment; diabetes, or iron overload disease, are at higher risk for severe disease and death from eating contaminated raw oysters.

[Reginald Tucker] Where do most of the oysters people eat come from?

[Duc Vugia] In the United States, oysters are farmed on all coastal regions, including the Atlantic, Gulf, and Pacific. Most of the oysters harvested come from the Gulf of Mexico.

[Reginald Tucker] Is there a way to treat raw oysters that would kill bacteria that cause disease—sort of the way they pasteurize raw eggs, for instance?

[Duc Vugia] Yes, there are ways to treat raw oysters after harvest to kill bacteria. Three methods are available commercially. One method is called individual quick freezing, by which half-shell oysters are rapidly frozen then stored until consumption. A second method is heat-cool pasteurization, by which oysters are heated in warm water and then dipped in cold water. And the third method is high hydrostatic pressure processing, in which oysters are subjected to pressure up to 45,000 pounds per square inch. All three methods can reduce *Vibrio vulnificus* bacteria to “non-detectable” levels.

[Reginald Tucker] Are cooked oysters safer than raw ones? Are they free of disease?

[Duc Vugia] Cooked oysters are safer than raw ones because thorough cooking kills bacteria and viruses. However, not all cooked oysters are cooked sufficiently to kill these organisms. So make sure that they are thoroughly cooked.

[Reginald Tucker] You did a study on the impact of a 2003 California regulation on selling raw oysters. Tell us about that regulation.

[Duc Vugia] In April 2003, California implemented a regulation to not allow the sale in California of raw oysters harvested from the Gulf of Mexico between April and October unless they were treated or processed to reduce *Vibrio vulnificus* bacteria to non-detectable levels.

This regulation was enacted because our public health surveillance continued to document illnesses and deaths caused by *Vibrio vulnificus* from eating raw oysters, most of which came from the Gulf of Mexico.

[Reginald Tucker] Were steps taken to improve the situation before the 2003 regulations?

[Duc Vugia] Yes. Before the 2003 regulation, California enacted other regulations to address this public health problem. In 1991, California adopted a regulation to require restaurants and stores that served or sold raw Gulf Coast oysters to provide a written warning to customers about the potential risk of eating raw oysters. This is the exact warning that was required: “Eating raw oysters may cause severe illness and even death in persons who have liver disease (for example, alcoholic cirrhosis), cancer, or other chronic illnesses that weaken the immune system.”

However, in 1996, the Los Angeles County Department of Health Services did a survey of 103 local restaurants and found that more than half of these either had no warning sign or a poorly visible one. They also documented several cases and deaths due to eating raw oysters, particularly among the Hispanic population. So in 1997, California updated the raw oyster regulation to require the written warning to be posted *prominently* in restaurants, and in *both* English and Spanish. But the cases and deaths continued to be reported. This led to the 2003 regulation.

[Reginald Tucker] What is the impact of the 2003 regulation?

[Duc Vugia] Our California surveillance data show that the annual number of illnesses and deaths caused by the foodborne *Vibrio vulnificus* dropped significantly since 2003. Among persons who ate raw oysters and no other seafood, no one died from *Vibrio vulnificus* illness after 2003 compared with up to five deaths each year before 2003.

When we looked at surveillance data nationwide, except for California, there was no decline since 2003 in the number of people with *Vibrio vulnificus* infection from eating raw oysters.

We concluded that the 2003 state regulation resulted in a significant decline in raw oyster-associated *Vibrio vulnificus* illnesses and deaths in California.

[Reginald Tucker] Is there a bottom line here? Should people just stop eating raw oysters altogether?

[Duc Vugia] The bottom line is that unprocessed raw oysters have a small but real risk of being contaminated with bacteria and viruses, and people at risk for severe disease or death from *Vibrio vulnificus* bacteria should avoid eating unprocessed raw oysters. Oysters that have been processed commercially to kill bacteria or that have been cooked thoroughly are safer and can be enjoyed by everyone.

[Reginald Tucker] Thank you, Dr. Vugia. I've been talking with Dr. Duc Vugia about his study, Impact of 2003 State Regulation on Raw Oyster-associated *Vibrio vulnificus* Illnesses and Deaths, California, USA, which appears in the August 2013 issue of CDC's journal, *Emerging Infectious Diseases*. The article is available at cdc.gov/eid.

If you'd like to comment on this podcast, send an email to eideditor@cdc.gov. I'm Reginald Tucker, for *Emerging Infectious Diseases*.

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