

What is *Vibrio vulnificus*?

Vibrio vulnificus is a disease-causing organism that occurs naturally in coastal waters most commonly found in the Gulf of Mexico, but also throughout the world. The level of this bacteria increases during warm weather months. Its presence is not the result of pollution and does not change the appearance, taste or odor of the affected shellstock that includes oysters. The U.S. Food and Drug Administration estimates that 5 to 10 percent of all oysters contain *Vibrio vulnificus*.

Who is at risk for becoming infected?

Most healthy people can eat raw oysters containing *Vibrio vulnificus* without becoming seriously ill, but up to 25% of Florida residents may be at increased risk. Those people at risk include:

- People with liver disease from hepatitis, cirrhosis, alcoholism or cancer; account for most cases of severe illness. Their risk of death from *Vibrio vulnificus* is over 200 times greater than for the general population. (Liver disease may exist even if only drinking two or three drinks each day and exhibiting no symptoms.)
- People with stomach disorders, including previous stomach surgery and reduced stomach acid (e.g., from antacid use).
- People with diabetes.
- People with cancer (including lymphoma, leukemia and Hodgkin's disease).
- People with hemochromatosis, an iron overload disorder.
- People with long-term steroid use (for asthma and arthritis).
- People who are HIV-positive or who have impaired immune systems due to medication or chronic illness.

It is important to remember that *Vibrio vulnificus* infection in high-risk individuals can lead to death in approximately 2 days. If you have any

of these symptoms see your physician immediately for medical treatment.

How can you become ill?

Illness usually results from eating raw or undercooked oysters containing *Vibrio vulnificus*. Eating raw oysters with hot sauce or while drinking alcohol does not destroy the bacteria. Illness can also occur when cuts, burns, or sores come in contact with seawater containing *Vibrio vulnificus*. The organism may invade the bloodstream, causing a severe illness (sepsis) that is fatal in 50% of all cases.

What are the symptoms?

Symptoms include vomiting, diarrhea, stomach pains, severe weakness, skin rashes and blisters, shaking, chills and high fever.

How is *Vibrio vulnificus* diagnosed and treated?

Vibrio vulnificus infection is diagnosed by routine stool, wound or blood cultures when there is a suspicion for this organism. Treatment is with antibiotics.

What can be done to prevent *Vibrio vulnificus* infections?

Persons with liver disease or any of the other conditions listed should only eat oysters that have been thoroughly cooked or treated and labeled as "Processed to reduce *Vibrio vulnificus* to non-detectable levels."

Is *Vibrio vulnificus* a serious problem?

Vibrio vulnificus is a leading cause of reported deaths from foodborne illness in Florida. From 1988 through 2001, 67 deaths were reported out of a total of 138 oyster related *Vibrio vulnificus* cases in Florida. During this same time period 81 non-oyster related cases also occurred.

Shellfish Harvesting

Because shellfish harvested from polluted water may cause human illness including typhoid, hepatitis and salmonellosis it is important that oysters come from approved waters free from fecal contamination.

Unfortunately, even legally harvested oysters may contain *Vibrio vulnificus*. The Interstate Certified Shellfish Shippers List (ICSSL) designates licensed certified shippers. These dealers are regulated so the consuming public may have added assurance of a safe, wholesome food supply. The list may be found at: <http://vm.cfsan.fda.gov/~ear/shellfis.html>

Shellstock Labeling Requirements

Shellstock must be obtained in containers bearing legible source identification tags or labels that are attached by the processor that ships or reships the stock. The shellstock tags must be handled properly so that identification of the shellstock source is maintained.

- Tags should remain attached to the original container whenever possible.
- If tags are removed they must be maintained in chronological order for 90 calendar days from the date the container is emptied.
- The record keeping system must be able to correlate the tags from the containers to the dates the shellstock was served or sold.

Is *Vibrio vulnificus* the result of poor product handling procedures?

No. Prompt and continuous refrigeration at temperatures of 41°F or colder may slow growth of *Vibrio vulnificus*, when the organism is present in oysters at the time of harvest. While the risk to the consumer can be lowered by prompt cooling practices during harvesting, much is still unknown about *Vibrio vulnificus*. For example, the level of contamination necessary to cause illness has not yet been determined, making it impossible to state a safe food level for this organism.

Visible Characteristics of Quality Oysters

Uncooked oysters in the shell should not gape and should close readily when tapped. If the shell does not close tightly or the oyster meat is dry when the shell is open, the product should be discarded. Avoid eating oysters having a broken or damaged shell. The meat of shucked oysters is usually plump with a creamy tan color and should smell fresh and mild.

Are there any times of the year in Florida when oysters are more likely to be contaminated with *Vibrio vulnificus*?

Yes. Oysters are most likely to be contaminated during the warmer months of June through October when 85% of illnesses have occurred. They are least likely to be contaminated during the months of December through March.

Consumer Information

All food service establishments serving raw oysters in Florida (even if utilizing post-harvest treated oysters) are required by the Florida Department of Health to display “either on menus, table placards, or elsewhere in plain view of all patrons,” the following notice:

<p>Consumer Information:</p> <p>There is a risk associated with consuming raw oysters.</p> <p>If you have chronic illness of the liver, stomach or blood, or have immune disorders, you are at greater risk of serious illness from raw oysters, and should eat oysters fully cooked.</p> <p>If unsure of your risk, consult a physician.</p> <p>Source: 64D-3.013(7) Florida Administrative Code</p>

An 8-½ x 11-½” poster containing the warning language—DBPR Form HR 5025-131, or in Spanish as DBPR Form HR 5025-531—is available from the Hospitality Education Program (HEP) or at www.hospitalityeducation.org

Are there any safe, practical methods to eliminate *Vibrio vulnificus* from raw oysters?

No. Neither purging (depuration) nor low heat treatment (heat shock) of oyster shellstock will completely eliminate *Vibrio vulnificus*. Several post-harvest treatments are currently recognized including quick freezing, cool pasteurization and pressure treatment. These

treatment technologies help reduce the risk of *Vibrio vulnificus* to the consumer.

Eating properly cooked oysters is safe for everyone.

Cooking Information

Guidelines for Cooking Oysters	
Steaming shellstock*	4 – 9 minutes
Boiling shellstock*	3 – 5 minutes at full boil after they gape (open)
Frying shucked oysters	3 minutes in oil at 375°F
Boiling shucked oysters	3 minutes boiling or simmering or until the edges curl
Broiling shucked oysters	3 inches from heat for 3 minutes
Baked oysters	10 minutes at 450°F
Food Code requires raw animal food to be cooked to the equivalent of 145°F for 15 seconds.	
*Use small pots to boil or steam oysters or shellstock to assure those in the middle will be thoroughly cooked. Discard any oysters that do not open during cooking, as they may not have received adequate heat treatment.	
Source: U.S. Food & Drug Administration (FDA)	

For more information concerning oysters or *Vibrio vulnificus* infections or outbreaks, please contact the Division of Hotels and Restaurants at 800.749.6368. Or visit the FDA Center for Food Safety & Applied Nutrition: Bad Bug Book: *Vibrio vulnificus* www.cfsan.fda.gov/~mow/chap10.html

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Vibrio vulnificus and Raw Oysters: Are You at Risk?



DIVISION OF HOTELS AND RESTAURANTS

Florida Department of Business and Professional Regulation

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