

Chapter 8. Consumers and Public Health

Overview

- Connecticut molluscan shellfish are an excellent local source of protein and omega-3 fatty acids.
- Oysters, clams, mussels and scallops are often consumed either raw or partially cooked. They can pose a public health risk for foodborne illness if not grown and handled properly.
- Consumers with specific health conditions should avoid eating raw or partially cooked shellfish altogether.
- The quality of water from which shellfish are harvested and the manner in which shellfish are handled from harvest to the point of consumption are key factors in protecting consumers from unintended contaminants.
- The National Shellfish Sanitation Program under the U.S. Food and Drug Administration (FDA) provides guidance on controlling the safety and sanitation of shellfish destined for human consumption during grow-out, processing and shipping.
- The NSSP is implemented by the states through the Interstate Shellfish Sanitation Conference, in cooperation with the FDA.
- As a member of the ISSC, the Department of Agriculture, Bureau of Aquaculture is the shellfish control authority in Connecticut responsible for enforcing the NSSP.
- Shellfish farmers, harvesters and dealers in Connecticut are trained in the safe handling, processing and storing of molluscan shellfish and operate under a food safety management program built on Hazard Analysis and Critical Control Points principles.
- Retailers, restaurants, recreational harvesters and general consumers are also responsible for properly handling, storing and preparing molluscan shellfish.
- Investigations of shellfish-related illnesses are conducted by the Connecticut Department of Public Health with the Connecticut DA/BA.

Shellfish Consumption Benefits and Risks

Clams and oysters are excellent sources of low-fat protein²¹. Wild and farmed oysters and mussels provide 500-1000 mg of heart-healthy omega-3 fatty acids per 3-ounce cooked portion, while clams provide between 200 and 500 mg² of omega-3s²¹. Clams consistently rank 9th or 10th on the list of top 10 seafood species consumed per-capita in the U.S., equaling 0.4 pounds of clams consumed per person in 2013²².

Key factors in protecting consumers from unintended contaminants include the quality of shellfish harvest waters and the manner in which shellfish are handled. Oysters, clams, mussels and scallops are often consumed either raw or partially cooked. Shellfish control authorities require that shellstock (live shellfish, in shells) intended for raw consumption bear a tag instructing retailers to inform customers, particularly those with specific medical conditions, that consuming raw or undercooked shellfish can increase the risk of foodborne illness. Consumers suffering from liver disease, chronic alcohol abuse, diabetes, and stomach, blood, and immune disorders are cautioned to avoid eating raw or partially cooked shellfish altogether.

Compliance with National Standards

The National Shellfish Sanitation Program under the U.S. Food and Drug Administration provides guidance on controlling the safety and sanitation of shellfish destined for human consumption during grow-out, processing and shipping. The NSSP is a cooperative program between the FDA and state governments through the Interstate Shellfish Sanitation Conference. The program promotes safety and sanitation across state boundaries through federal-state partnerships and promotion of uniform state shellfish programs.

The Department of Agriculture, Bureau of Aquaculture, is the shellfish control authority in Connecticut (CGS §26-192a), and is a member of the ISSC responsible for enforcing the NSSP along with the Connecticut Department of Energy and Environmental Protection. Connecticut's shellfish sanitation program is regularly evaluated by FDA to ensure consistency among states and compliance with national standards outlined in the NSSP Model Ordinance. The FDA evaluation covers how shellfish growing areas are classified, how *Vibrio* risk management is implemented, harvest control, plants, shipping and the DA/BA laboratory. The DEEP Division of Law Enforcement is responsible for the harvest patrol program; all other programs are administered by the DA/BA.

Water Quality and Safe Shellfish

The two most important factors controlling the safety of shellfish are harvest area water quality and shellfish handling from harvest to consumption. Because shellfish are filter-feeders, pathogens and viruses from sewage, run-off or animal waste that may be present in Long Island Sound are concentrated in shellfish tissues. The same is true for contaminants such as pesticides, heavy metals and organic compounds. Pollution can also be naturally-occurring. For example, certain plankton species in Long Island Sound and embayment waters can produce toxins (harmful algal blooms) that concentrate in shellfish tissues through the filter-feeding activities. After shellfish are harvested, improper handling can result in chemical contamination or bacterial growth, rendering the shellfish unsafe for human.

To minimize the risk associated with consuming shellfish grown in restricted or prohibited waters, sanitary surveys are conducted by the DA/BA to accurately classify shellfish growing waters in town and state waters as Approved, Conditionally Approved, Restricted, Conditionally Restricted, or Prohibited depending on the pollution sources and water quality in a growing area. The DA/BA conducts sanitary surveys to evaluate pollution sources and meteorological and hydrographic factors (currents, tides, etc.) that affecting local water quality. Commercial harvesters must follow the classification associated with each leased bed, and confirm that any Conditionally Approved area is open prior to harvesting shellfish from it. Commercial activities in growing areas classified as Prohibited are limited to the removal and transplant of seed oysters, following strict size limits and depuration (self-cleansing) time frames, before harvesting them for market. Removal of shellstock from a Prohibited area for any human food purpose is not allowed. Shellfish harvested from growing areas classified as Restricted must be transplanted to Approved or Conditionally Approved "open" beds for a minimum amount of time followed by testing to ensure they are safe for consumption.

Recreational shellfish harvesters must check the daily status (open, closed) of specific recreational beds by calling a “hotline” in addition to following all permit requirements, daily limits and other regulations²³.

***Vibrio parahaemolyticus* Control Plan**

In recent years, a naturally occurring bacteria called *Vibrio parahaemolyticus* (*Vp*) has caused a number of shellfish-related illness outbreaks. This bacteria occurs in brackish and salt-water environments, and has been found in higher numbers or concentrations in coastal waters in summer when water and air temperatures are warmer. In 2013, Connecticut was the source of oysters associated with at least 23 *Vp* illnesses, while to date, hard clams (Northern quahogs) have only been linked to sporadic illnesses in Connecticut.

Commercial harvesters minimize the risk of *Vp*-related illnesses by operating under a more restrictive shellfish harvest and cooling program during warmer months. Efficient and effective methods for rapidly cooling and storing shellfish during these higher risk months were developed collaboratively by industry and the DA/BA. Since their institution, *Vp* controls have been very effective in reducing the number of illnesses associated with oysters harvested from Connecticut waters and public health officials have recognized Connecticut’s *Vibrio parahaemolyticus* control plan nationally as a public health success story.

Recreational harvesters should follow recommended guidelines for harvesting, chilling and storing shellfish to minimize the risk of illness from *Vp* and other bacteria that can grow under favorable conditions and render the shellfish unsafe to eat²⁴.

Consumer Handling of Shellfish Products

When consumers purchase molluscan shellfish in any form, they assume the mantle of responsibility for handling and storing the product properly so they may enjoy eating a safe product. This includes keeping all shellfish adequately chilled during transportation from the point of purchase. Guidance information is available to help consumers properly handle, chill, store, and prepare shellfish products for their enjoyment²⁴.