

National Shellfish Sanitation Program

Guide for the Control of Molluscan Shellfish

2007

Section IV. Guidance Documents

Chapter III. Harvesting, Handling, Processing, Distribution

Guide Contents

.05 Guidance For a Time-Temperature Evaluation of a Shellfish Implicated Outbreak

Because shellfish are filter feeders, they can concentrate microorganisms, marine biotoxins and poisonous or deleterious substances from the water column when these substances are present in the growing area. In addition, shellfish, like any other food product, can become unfit for human consumption through the introduction of contaminants during handling, storage, transport, distribution and processing. Furthermore, improper handling and storage can contribute to the increase of naturally occurring pathogens to hazardous levels in shellfish meats. The intrinsic risk from illness induced by microorganisms associated with consumption of raw or partially cooked shellfish products compels the shellfish control authority to act quickly and effectively when shellfish are implicated in a food-borne outbreak. When illness has occurred, the Authority needs to immediately begin an investigation before critical evidence is inadvertently lost or destroyed.

Currently, the NSSP Model Ordinance does not call for any action if illness is limited to only one person. This is appropriate for molluscan shellfish borne illness caused by microorganisms associated with pollution events. However, when naturally occurring marine bacteria such as *Vibrio vulnificus* or *Vibrio parahaemolyticus* are suspected to cause the illness an evaluation of the possibility of time-temperature abuse of the product is critical to understanding how the illness may have been prevented. A time-temperature audit provides information regarding the time-temperature experience of the product implicated as well as the health conditions of any ill persons which may have contributed to their susceptibility to the disease. Although the gathering of this data has been a public health focus for several years, there has been no effort to standardize how or what data are gathered during an illness investigation. When naturally occurring marine bacteria are believed to be the source of the shellfish implicated illness or outbreak, the time-temperature history of the product and the health of the persons may be more relevant than the traditional investigatory focus on tracing the origin of the product back to the shellfish growing area.

For additional information concerning the *Vibrio* organisms, see Watkins and McCarthy (1994) and the NSSP Guidance Documents contained within Chapter IV- Naturally Occurring Pathogens..

Time-Temperature Evaluation of a Shellfish Implicated Outbreak

The Authority should promptly conduct an audit of the time-temperature history of the

implicated product in a shellfish disease outbreak to the extent practicable. The Authority should use all records from any measuring devices in conveyances or coolers used to transport the product, or any records of conditions associated with the implicated product as it moved from harvest to consumption. Where necessary, the Authority in the state of shellfish product origin should be contacted to provide assistance in gathering information. The audit must include the retail market or restaurant where the victim bought the shellfish product, the facility of the person who sold the product at the retail market or restaurant, the facilities of all dealers and common carriers who handled the product following its harvest, and the practices and facilities of the person who harvested the shellfish. The audit should include, but should not be limited to, the following points.

In the retail market or restaurant implicated in the shellfish illness outbreak, the Authority should, at a minimum,

Record the ambient temperature in the establishment; observe the time-temperature control in the establishment, i.e. how the product was handled:

Examine the establishment's records for the temperature of the storage device or facility used for the implicated product while at the establishment, or observe and record the temperature of the storage device or facility during the investigation; observe and record the temperature and age of the remaining product at the establishment. The age of the product must be cross checked with transaction records;

Observe the controls to prevent cross contamination of the implicated product; and provide for the immediate sampling and testing for the suspect organism(s) of any remaining product from the retail or food service location implicated in the outbreak.

The Authority should determine if the dealer or person who sold the product to the retail market or the restaurant is on the ICSSL. If the person is not on the ICSSL, the Authority should gather any pertinent information regarding the status of time-temperature controls practiced by this person such as:

- Inspection reports for the person's facility;
- Observed temperature of the person's conveyance used to transport shellfish product; and
- Presence or absence of adequate refrigeration capability in the person's conveyance.

If the dealer is on the ICSSL, the Authority should conduct an inspection of the dealer's facility and records for purposes of gathering data from time-temperature control procedures and practices at that facility including:

- The presence or absence of adequate refrigeration capability of the dealer's conveyance;
- The presence or absence of temperature records for the delivery conveyance;
- The observed temperature and time-temperature control practices on the dealer's loading dock;

The transaction records demonstrating the product's age from the date of harvest of the implicated product; and

- The dealer's observed product rotation practice (i.e., the existence of product of widely

differing ages).

For additional information concerning the ICSSL, see the NSSP Guidance Document, Chapter III .03: *Dealer Certification and the Interstate Certified Shellfish Shippers List*.

The Authority should gather data similar to that above from all dealers or common carriers (certified or uncertified) between the point of first receipt from the harvester and the retail market or restaurant.

The Authority should inspect the original dealer's facility (i.e. the point of first receipt from the harvester). If the original dealer's facility is in another state, the Authority should request the appropriate Authority in that state to perform an audit and to share the results of the audit. This audit should, at a minimum,:

- Determine if there are adequate provisions for product refrigeration;
- Observe temperature and/or records of temperature for the dealer's refrigeration facility;
- Observe general time-temperature control procedures and practices; and
- Observe the temperature and age of shellfish product on-site under receipt from harvesters or under storage.

To the extent practicable, the Authority should gather information concerning the time-temperature control capability of the harvester of record for the implicated product. If the product was harvested in another state, the Authority should request the appropriate Authority in that state to perform an audit and to share the results of the audit. This audit should, at a minimum, determine:

- If adequate shading was provided for harvested shellfish product;
- The existence of mechanical refrigeration for storage of harvested product; and
- If records of prior enforcement actions against the harvester exist.

In cases where *Vibrio* species are the suspected organisms causing the illness or outbreak, the Authority should investigate the health status of the victim(s) to determine:

- If there were underlying health problems which may have contributed to the occurrence of the illness(es);
- If the victim(s) was aware of his underlying condition;
- If the victim(s) was aware of his high-risk status;
- If the victim(s) had been advised not to consume raw shellfish; and
- If the establishment had posted point-of-sale information for high-risk consumers.

References

Watkins, W. and S. McCarthy. 1994. *Proceedings of the 1994 Vibrio vulnificus Workshop*. U.S. Department of Health and Human Services, Public Health Service, Office of Seafood (HFS-400), Shellfish Sanitation Branch, 200 C Street, SW, Washington, D.C. 175 pages.