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Guide for Restaurant Operators Serving Raw Oysters and Bivalve Shellfish



June 2019

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In collaboration with Regional Health Authorities

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Front cover photos (clockwise from top): Shellfish receiving log (Joe Fortes), temperature of beach oysters in cooler (Finns Seafood, Chops & Cocktails), bleach (chlorine) sanitizer check (FIVE Kitchen & Oyster Bar), date labelled clams in cooler (Finns Seafood, Chops & Cocktails)

Photos in blue boxes: temperature check during oyster receiving (Fish Shack), shellfish tags (Merchants), shucking oysters (Boathouse), menu warning on table (Hooked Fish Bar), chlorine bleach check (Horizons)

Background

Public health agencies recognize the challenges and negative impacts on businesses when customers become ill after eating contaminated oysters and other shellfish. This guide will assist restaurant operators serving raw oysters and shellfish to understand and manage shellfish risks. It will provide recommendations for shellfish control and how to best manage information that informs shellfish investigations.

This guide is organized into sections that will help operators:

- understand the risks associated with shellfish
- implement safe oyster and seafood handling procedures
 - receiving and approved sources
 - temperature controls (cook and chill)
 - handling and preparation
 - service of raw oysters
- maintain documentation and signage
- organize shellfish tags
- create food safety and sanitation plans
- understand an operator's role during illness investigations

Process steps starting with **Receiving shellfish** through to **Documentation required** have best practices summarized in point form in the blue boxes and numbered recommendations are summarized in Appendix 1.

For further information about shellfish risks enroll in the *Vibrio* awareness training offered through Vancouver Island University <https://scitech.viu.ca/natural-resource-extension/vibrio-parahaemolyticus-v>

Suggested citation for this document:

BC Centre for Disease Control and Regional Health Authorities. Guide for Restaurant Operators Serving Raw Oysters and Bivalve Shellfish; 2019 Jun. Available from: <http://www.bccdc.ca/health-professionals/professional-resources/food-premises-guidelines>



Over-iced and date-labelled oysters in storage (photo @ Horizons)

Why are shellfish a concern?

Shellfish are grown in the marine environment where naturally occurring bacteria, viruses or toxins present in algal blooms may accumulate in shellfish as they grow. Pollution sources in marine waters from spills and dumping may also reach shellfish growing areas and accumulate in the shellfish. When a harmful bacteria, virus or toxin is present foodborne illness may result.

Oysters and other bivalve shellfish – mussels, clams, and scallops – are of greatest concern for contamination by marine toxins, bacteria and viruses because of how they feed. Bivalves are “filter-feeders” that consume the nutrients in up to 10 litres of seawater per hour by filtering it through their bodies. Sometimes harmful contaminants will stick to the shellfish and accumulate. There are also other types of shellfish, such as spot prawns and crabs that may be affected by contaminated water.

Illnesses that can occur when consuming shellfish

The table below describes different types of illness causing toxins, bacteria and viruses of greatest concern; the name of the illness caused; the types of shellfish often associated with the illness; and whether it can be present in cooked shellfish. Bacteria such as *Vibrio* can continue to grow in oysters after harvesting from shellfish farms if oysters are not refrigerated and maintained at cold temperatures from harvest, during transportation, and through to service at food premises.

Cooked shellfish containing harmful toxins can still cause illness as cooking does not destroy the toxin!

Illness causing contaminants	Name of illness caused	Types of shellfish usually eaten	Present in cooked shellfish?	Grows inside shellfish after harvest
TOXIN	Amnesic shellfish poisoning (ASP)	Mussels and clams	Yes	No
TOXIN	Diarrhetic shellfish poisoning (DSP)	Mussels and clams	Yes	No
TOXIN	Paralytic shellfish poisoning (PSP)	Mussels, clams, oysters, crabs	Yes	No
VIRUS	Norovirus	Raw oysters and spot prawns	Sometimes	No
VIRUS	Hepatitis A	Mussels and clams	Sometimes	No
BACTERIA	<i>Vibrio parahaemolyticus</i>	Raw oysters	Rarely	Yes

Appendix 2 provides details on the symptoms of these shellfish acquired foodborne illnesses.

Vibrio parahaemolyticus 3D image:

These bacteria are normal inhabitants of the ocean and are able to swim by propelling their bodies using the whip-like cord structure called a pili. They grow rapidly at temperatures above 4°C



Photo source: Public Health Image Library, Centers for Disease Control and Prevention. ID#21922
Illustrator Jennifer Oosthuizen

For more information about shellfish harvesting controls and *Vibrio* bacteria visit the BCCDC shellfish harvesting & control web-site at <http://www.bccdc.ca/health-professionals/professional-resources/shellfish-harvesting-control>



Receiving Shellfish

- Accept order from approved suppliers when the temperature of the oysters is at or less than 4°C (held on ice)
- Verify and record temperature
- Verify and record tags are present
- Record and track in the shellfish receiving log
- Put away immediately
- Check the temperature of delivery trucks are at 4°C or colder
- Keep tags or traceable info with shellfish (date received and tag)

Approved sources of shellfish

Commercial shellfish are monitored for marine biotoxins. When levels are elevated those harvesting areas and farms are closed. Shellfish processors check every incoming batch of shellfish coming from an open approved area. Do not engage in “back-door” shellfish sales (i.e., illegal and untraceable shellfish sales); only accept product from an authorized processor or distributor with valid documentation, or you may put your customers at risk of foodborne illness.

Receiving and record-keeping

When receiving oysters, shellfish and other perishable foods, only accept shipments of cold foods (at or below 4°C)

If the oysters or shellfish are received in melted ice and the temperature is above 4°C reject the shipment. Check the delivery truck temperature to ensure that the shellfish you are paying for are being handled properly.

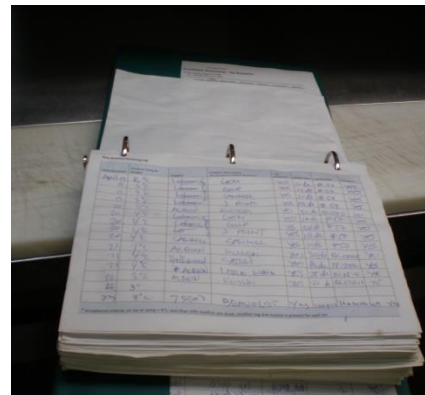
When receiving orders there will be shipping documents to be signed before the driver goes. Do not be pressured into signing until you have verified the order, that the shellfish all have a shellfish tag attached, and that the temperature of the shipment is satisfactory. Once the order is received, immediately place it into a cooler at or below 4°C.

Keep the shellfish tags (or a copy of the tags) with the shellfish. Record the distributor you purchased from, the date purchased, the type of shellfish, as well as the processor and lot or batch number.

STELLAR BAY SHELLFISH	
7400 Island Hwy. West, Bowser, BC V0R 1G0 250-757-9304	
Cert: BC 0741 SS	
ORIGINAL SHIPPER'S CERT. No. 1- OTHER THAN ABOVE:	
HARVEST DATE: Mar 28, 16	PROCESS DATE: Mar 28, 16
HARVEST LOCATION: BC14-B DFEF BAY CLF#14C7063	
TYPE OF SHELLFISH: Oyster, Stellar Bay Colds FARM RAISED	
PRODUCT OF CANADA	
QUANTITY OF SHELLFISH: 5 DOZEN	
THIS TAG IS REQUIRED TO BE ATTACHED UNTIL CONTAINER IS EMPTY OR IS RETAGGED AND THEREAFTER KEPT ON FILE FOR 90 DAYS.	
TO: (C04)295-2010 Albion Fisheries Ltd. 1907 No. 6 Road Richmond, BC V6V 1W3	RESHIPPER'S CERT. NO.: BC-0592-SP PO58070 KEEP REFRIGERATED

Example shellfish tag showing processor & address, date of harvest, harvest location, type of shellfish & quantity.

Record and track the shellfish received into your shellfish receiving log. An example of a receiving log is shown in Appendix 4. You can also record the temperatures in this log and note if the shellfish was accepted or rejected.



Shellfish receiving logbook
(photo @ Joe Fortes)



Shellfish tag management

- Tags must be kept on site for 90 days for health requirements
- Tags must be sorted by date used/served & organized by volume
- Tags must be kept dry and in readable condition
- Invoices must be made available
- Operators and staff should improve their knowledge about shellfish risks

Shellfish harvest tag management Shellfish harvest tags must be available on-site for a minimum of 90 days¹ and linked as tightly as possible to customer meals. Shellfish tags are crucial pieces of evidence to ensure oysters and other shellfish linked to an illness are traceable back to the farm location.

There are many possible methods to organize shellfish harvest tags for storage— as long as the system you use in your premises can provide this information when requested during an investigation the method is satisfactory. Shellfish harvest tags may be organized daily, weekly or monthly depending on the volume and size of your premises. Tags must be kept and stored on site for a minimum of 90 days for health requirements.

We recommended that tags are sorted by the date used for service and bundled securely (tape, elastic, separate bag).

Record the date that shellfish from a new lot were first served, either on the tag or shellfish receiving log. When the same lot is served over multiple days or there are multiple tags with the same lot record the last day of service for that lot. Keep all shellfish tags even if they have the same lot number.



In this photo, oyster tags are kept with the oysters during refrigerated storage. The tag is in a plastic bag to protect it from getting wet. Oysters are kept cold by overtopping with ice, and a perforated tray under the oysters allows excess fluids to drain away so oysters do not drown.

Raw oysters stored in stainless trays (photo @ Boathouse)

Invoice control Invoices must also be available on demand during an illness investigation, even if the invoices are stored off-site of the premises. Arrange to provide these to health inspectors so that dates of shipments can be verified upstream in the distribution chain, i.e., by the distributor, processor, and farm. Other provincial and federal agencies require these documents to investigate live BC oyster sales.

Note: Tags often become wet when in contact with ice and shellfish. Allow them to dry or wrap in paper towels before dating and storing. Avoid storing the tags in containers or filing systems that do not allow excess moisture to drain away.

Shellfish tags for oysters served



on April 25th are bundled in paper towels, labelled and stored together with the other tags from that month (photo @Joe Fortes)

¹– Note: Ministry of Agriculture provincial requirements request traceability for up to one year (see Appendix 6).

Temperature Control – Cook and Chill

Temperature control is important during each step that oysters and shellfish are handled. Here we emphasize two types of safety controls: chilling and cooking.

Chilling – keep oysters cold!

Oysters served raw must be received at 4°C or less and maintained at 4°C or less before service to ensure bacteria do not have the chance to grow. Display and overtop oysters with plenty of ice (see photo). Display live oysters cup side down (flat side on top) so fluids don't leak out when they open to breathe. *Vibrio* bacteria grow in marine waters all year round. When temperatures get warmer these bacteria multiply very quickly. *Vibrio parahaemolyticus*, the type of *Vibrio* most commonly associated with foodborne illness in BC, is often a concern in the summer-time for this reason. Temperature control is CRITICAL to ensure that the bacteria in raw oysters do not grow rapidly before service to customers.



*Fresh oysters on display being overtopped with ice
(photo @ Rodney's Oyster Bar)*

Cooking – 90°C for 90 seconds

Oysters and other shellfish are high risk products when eaten raw or lightly cooked. Viruses can be destroyed by cooking, but high heat must be held to be effective. Cooking to an internal temperature of 90°C (200°F) for 90 seconds will provide enough of a safety margin to inactivate norovirus and hepatitis. To verify the final temperature of a recipe use an internal probe tip thermometer to measure the oyster's temperature.

Recipe and photo of properly cooked breaded oysters (right) prepared by Chef Chris Andraza (photo @Fanny Bay Oysters)

A suggested process that ensures a 90°C internal temperature uses two extra steps:

1. Bring whole shucked oysters to a boil for 5 minutes
2. Chill rapidly to 4°C within one hour and store refrigerated

Cook to order by baking, deep-frying, or pan-frying.

Temperature tips to prevent *Vibrio* growth:

1. Take temperature of your order before accepting it – if the temperature is above 4°C, reject the order from the supplier.
2. Put orders away, into refrigerated coolers, immediately.
3. Minimize total time out of refrigeration to less than one hour (i.e., washing, shucking, and other preparation activities in < 1 hr).
4. Overtop display oysters with ice.
5. Ensure display oysters are COLD (at 4°C or less). An infrared gun provides quick readings with ease.
6. Serve raw oysters on ice.

Breaded deep-fried oysters at >90°C internal temperature after frying



Toxins are especially dangerous, because toxins are not destroyed by cooking, boiling, or even canning.

Marine toxins are resistant to heat and can be present in the broth the shellfish is cooked in, as well as in the shellfish meat. Toxins may be present crab flesh after boiling, but are usually highest in the digestive glands of the crabs. Crab digestive glands should be removed before boiling so that the boiling water doesn't get contaminated and spread the toxin to the crab meat.



Handling and Preparation

- Pre-rinse to remove dirt and debris before further prep or service
- Minimize time oysters are not held in refrigerated conditions during rinsing, shucking and preparation
- Keep shellfish varieties separated
- Ice, refrigerate, and protect from contamination

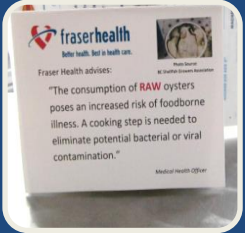
Preparation before service

Oysters and shellfish may need pre-rinsing to remove loose sand and soils. Other preparation activities may also be required, for example, mussels may require scrubbing to remove seaweed. Where possible assign a dedicated sink for these processes. Ensure that the areas where these activities occur are properly cleaned and sanitized before and after this work to minimize the chance that sands, soils, bacteria, and viruses will cross-contaminate other foods. Staff can protect themselves and foods they handle by wearing gloves and practicing frequent hand-washing.

Oysters must not spend more than two hours outside of refrigerated control before service to customer. Minimize the time oysters and shellfish spend outside of refrigerated control during rinsing, cleaning, shucking, and other preparations. This is particularly important for oysters that are served raw. Store different lots and varieties of oysters in separate containers – do not co-mingle lots – label containers with date and variety and keep shellfish harvest tags with the oysters until service. Cover oysters but do not seal them into a container, they are living organisms. Do not let them sit in melted ice-water as fresh water will kill them, ensure that melted water can drain away.



Gloves are worn during oyster shucking, oysters are served over ice (photo @ Joe Fortes)



Service of raw oysters

- Serve over ice to keep chill temperatures
- Replace ice if melted before raw oysters are fully consumed
- Serve smaller batches when large amounts are ordered
- Describe oyster varieties to customers
- Display health advisory on menu or table

Best practice is to serve raw oysters over shaved or cubed ice to ensure that the oysters are kept very cold. Most service platters of oysters are consumed quickly, however, if servers notice the plate is not consumed before the dinner service, within 30 minutes, or when ice has melted, best practice is to remove the plate and transfer oysters to a new plate with fresh ice. This will limit the opportunity of bacteria to grow, particularly on hot sunny days in outdoor eating areas.

If customers order a large batch of oysters, for example “buck-a-shuck” oysters before happy hour has ended, serve the order in small batches over time so oysters are chilled for as long as possible.



Serve oysters over ice to keep them chilled

Photo credit: Viviana Rische on Unsplash

Name the oyster varieties to the customer

Your customers are interested in the oyster varieties on the plate – let them know what they are! Describe the locations and names of the oysters to build recognition. This helps them to remember what they ate should an illness investigation occur.

Menu warning requirements

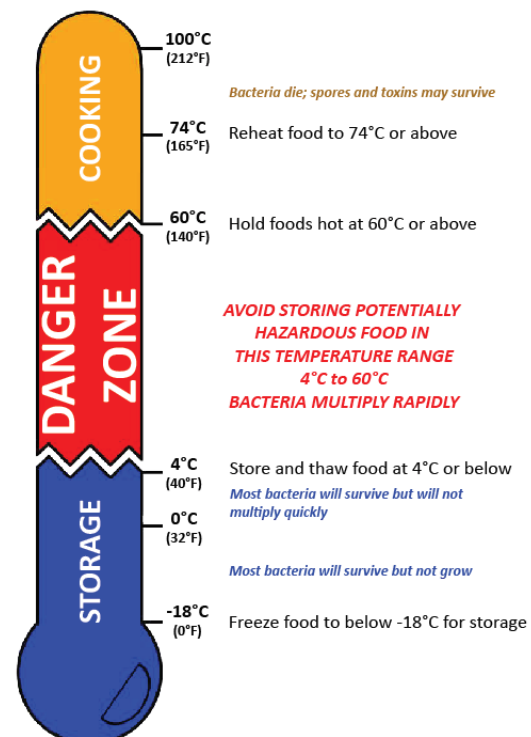
Restaurants serving raw oysters MUST display a public health warning from the Medical Health Officer of their health authority. This can be placed:

- On a display card at the table
- In the menu

“The consumption of **RAW** oysters poses an increased risk of foodborne illness. A cooking step is needed to eliminate potential bacterial or viral contamination.”

Medical Health Officer

Oysters and shellfish are potentially hazardous foods, bacteria will grow in them so keep them out of the danger zone. **Any oysters that have been left out for two hours or longer must be discarded.**



Food safety plans and sanitation plans

- Monitor & record temperatures on log sheets
- Front of house oyster displays must use ice to keep oysters cold. Ensure that:
 - Melted ice-water can drain away
 - Oysters rest on a bed of ice, &
 - Oysters are overtopped with ice
- Check temperature of display oysters to verify chill temperatures achieved
- Oysters held longer than 2 hours in the danger zone must be discarded
- Sanitation and food safety plans must control hazards and be shared with staff

Illness complaints and investigations

- Record and inform your health authority
- Record **contact information** (e-mail and phone)
- Record **what** was eaten (variety and lot of shellfish);
- Record **when** date of meal was eaten
- Record **quantity** the customer consumed, and **how many** other meals of the same type were served to other customers
- Verify with sales or reservation system if possible
- Advise ill customers to visit their doctor or phone the nurse line at 811

Food safety and sanitation plans are required

for all food premises in BC per the [Food Premises Regulation](#).

A food safety plan summarizes the hazards associated with receiving, processing, handling, and serving food. It should define the critical limits and corrective actions. An example for raw oyster service is shown in Appendix 3.

A sanitation plan summarizes who, what, when, and how often equipment, surfaces, and rooms must be cleaned and sanitized. The plan will describe to staff how to mix up a sanitizer and how to verify that the sanitizer is at the correct concentration.

How to mix up bleach sanitizer (between 100 and 200 ppm is required):

How to make a 200 ppm no rinse sanitizing solution:

- Mix 15 mL (1 tablespoon) of household bleach into 4 litres (1 gallon) of water; or mix 5 mL (1 teaspoon) of household bleach into 1 litre (4 cups) of water.

Use B.C.'s FOODSAFE Chlorine Dilution Calculator tool to make up the proper sanitizer strength based on the concentration of your bleach product
www.foodsafe.ca/dilution-calculator.html

Report and record illness complaints

Food premises are asked to record and report all illness complaints to the local health authority. It is helpful to have the name and contact information for your health authority near your phone log where an incoming call may first be received. Refer ill customers seeking medical care to their doctor or nurse line at 811.

An illness log should be kept as a convenient method to record contact information that identifies the complainant, their contact information (e-mail, phone number), and information about the meal consumed (example in Appendix 5).

When raw oysters are the suspect cause of illness, identify what variety of oyster was consumed, the date and time of the meal, and the lot number for that batch. Other helpful information is to review how many of the same meals were served that day to other customers.

If your premises uses a reservation system or a point of sale (POS) tracking system for purchases, verify that the complainant did consume the meal on the day they told you in case they have forgotten the day. This will ensure that the correct batches of shellfish are investigated.



Documentation required

- Food safety plan
- Sanitation plan
- Shellfish receiving and tracking log
- Shellfish harvest tags
- Shellfish purchasing invoices
- Temperature control charts
- Illness and complaints log

There are a number of records that must be maintained and available for review by inspectors. These records are important to verify traceability back to products in the case of a recall or illness investigation and to verify operator control and management of shellfish. Better records will help to remove contaminated foods more quickly and protect customers from illness. These records are listed below, with examples shown in the Appendices.

SHELLFISH				
STEP	FOOD SAFETY HAZARDS	CRITICAL LIMIT	MONITORING CRITICAL STEPS	CORRECTIVE ACTION
RECEIVING	Contamination Pathogens	Prof temp <4C Frozen temp <-18C Obtain shellfish from approved facility Review tags for future reference Ensure live shellfish are alive	Check temperatures Visual inspection Live shellfish should be closed tightly	Reject product if temperatures are not met or if live shellfish are open
STORAGE	Growth of Pathogens Contamination	Prof temp <4C Frozen temp <-18C Live shellfish to be stored twice daily in cold water Tags to be stored with product Thawed prawns to be used down covered dated and stored for a maximum of 2 days	Check cooler/freezer temp every 4 hrs Ensure mixing of live shellfish Check for tags Visual inspection	Lower cooler or freezer temperature If Prof are warmer than 4C for longer than 2 hrs discard Raise immediately Discard any live shellfish that do not close tightly Discard if tags not present Discard any thawed prawns more than 2 days old

Food safety plan for raw oyster service
(photo @ Horizons)

Documentation required in restaurants serving raw oysters and bivalve shellfish

- ☐ **Food safety plan compliant with recommendations (Appendix 3)**
 - Describes how your restaurant manages oyster and shellfish risks during receiving, processing and service steps
- ☐ **Sanitation plan**
 - Describes how the what, when, who and how often cleaning and sanitation occurs
 - Provides information to staff on how to mix and how to verify sanitizer concentrations are effective.
- ☐ **Shellfish receiving and tracking log (Appendix 4)**
 - Used to summarize incoming shipments, dates shellfish are received, and the temperatures upon receipt.
 - May be used to indicate when shellfish are first served. This will help to narrow down the shellfish harvest tags to be investigated during illness follow-up
- ☐ **Illnesses and complaints tracking log (Appendix 5)**
 - Used to record illness complaints
- ☐ **Shellfish harvest tags storage system for minimum 90 day for public health**
 - Shellfish harvest tags must be available on site for a minimum of 90 days following service of shellfish to customers for public health investigations. Ministry of Agriculture requirements expect tags to be kept for one year (Appendix 6)
 - Your system of storing must not damage the information on the harvest tags
- ☐ **Invoices**
 - Invoices must be made available on request to determine distributor, even if they are stored off-site
 - Invoices are used to verify consistency between the dates of meal consumption, harvest tags, and trace back to distribution records and shellfish harvests at the farm
- ☐ **Temperature control charts for coolers and freezers**
 - Used to track temperatures of your coolers (refrigerators) and verify oysters kept cold

Appendix 1. Summary of Recommendations

Recommendations for Receiving Practices	
1	All oysters for raw consumption and other shellfish must be received fully immersed in ice or by another method to keep products at 4°C or colder.
2	All oysters for raw consumption and other shellfish must be accompanied with an approved shellfish tag.
3	All oysters for raw consumption and other shellfish must be received and quickly put under refrigerated control. When oysters are received in packaging that maintains temperatures at or below 4°C, best practices are to refrigerate oysters immediately or within 30 minutes following receipt with a maximum delay of two hours after receipt.
4	Operators should purchase a temperature monitoring tool, such as an infrared laser thermometer. This can be used to quickly check the surface temperatures of incoming raw oysters and other perishable goods.
5	Operators are recommended to periodically check the temperatures of trucks delivering their perishable foods, and verify incoming shipments of fresh foods (e.g., oysters) are received at 4°C or colder.
6	Premises should use a shellfish log to track incoming shipments, especially when two or more shipments are received per week. Shellfish tag and receiving temperature should be recorded in this log. Corrective action should be taken when acceptance criteria is not met (i.e., if the shipment is rejected and what happens to the product). This should be incorporated into the premises food safety plan.
Recommendations for Handling and Preparation	
7	Oyster tag information and traceability must be maintained during refrigerated storage. The original tag or a reproduction must be retained with the raw oysters. If the original tag is not retained, a label on the oyster container must be traceable back to the shellfish log which is filled out at the time of receiving.
8	Labels on containers (e.g., plastic tubs, bus-boys) should, at minimum, indicate the date of receipt and oyster variety. These labels can be of any format (tape, cardboard, or photocopy of the original tag etc.) as long as the information remains readable throughout its use.
9	Each storage container should contain only one variety of oysters. If required, premises should purchase smaller containers.
10	Refrigerated storage of oysters should prevent oysters from contaminating other foods and oysters should be protected from contamination by other foods or sources. Best practice is to use single use wetted paper towels, alternatively clean wetted cloths may be used if they are dedicated for the purpose and washed and sanitized following each use.
11	Ice containers used to hold oysters must allow for excess melted liquid to drain away from the oyster.
12	Pre-shucking of raw oysters for same day service is acceptable when the oysters are stored under refrigerated conditions at or below 4°C. Shucked oysters should be covered with plastic wrap if not served within 2 hours of shucking. Pre-shucking oysters for storage longer than one day is not recommended. Oysters should be shucked in small batches to meet the demand, quality and safety of the operation.
13	Best practice is to pre-rinse all incoming oysters with potable water prior to shucking to remove visible dirt or debris. If a hose is used, it must be rated for potable water (i.e., not a garden hose).
14	Oyster processing activities (e.g., rinsed, labelled, shucked etc.), when occurring at room temperature, should not exceed one hour. The cumulative amount of time that oysters are held at room temperature before service must not exceed more than two hours. Oysters not under refrigerated control or held in the danger zone for longer than two hours in total must be discarded.
Recommendations for Service of Raw Oysters	
15	Oysters should be served over shaved or small cubed ice to keep them cold during service.
16	Large orders of oysters should be served in smaller batches to customers who pre-order large volumes (e.g., during buck-a-shuck hours).
17	Operators are encouraged to describe the varieties they serve, both on their menu and to their customers, even if the varieties change seasonally. Servers are similarly encouraged to name the varieties of oysters served to the customer.

Recommendations for Food safety plans, Sanitation plans and Temperature control monitoring

- 18** All premises serving oysters for raw consumption must monitor and record temperatures of the refrigerated storage coolers where raw oysters are stored, at a minimum frequency of once daily, with twice daily monitoring or more as optimal.
- 19** All premises that have front of house raw oyster displays must use ice to keep in-shell oysters cold. Melted ice-water must be allowed to drain. Ice must be below and overtop the oysters to ensure oysters are kept as close to 4°C as possible. Display smaller numbers of oysters to minimize time spent outside of mechanical refrigeration.
- 20** Premises are recommended to periodically check temperatures of oysters on display using a temperature monitoring tool (e.g., an infrared laser thermometer) to verify the oysters are at 4°C or colder, at least every two hours, with more frequent checks recommended. Verification of the activity by recording the time/date and temperature onto a temperature control log is recommended, and this should be incorporated into the premises food safety plan.
- 21** Sanitation and food safety plans should cover basic requirements to control hazards. The plans need to be followed, with complete records maintained, and kept up to date and accessible to all staff.

Recommendations for Shellfish harvest tag management

- 22** Public health requirements are shellfish tags must be kept in the restaurant for a minimum of 90 days. Premises must not discard duplicate tags. Invoice must be made available on request.

- 23** Premises should organize all shellfish tags (oyster and other bivalve shellfish) by date and by volume.

Volume Category	Oysters received per week	Expected # of Tags*	Time Interval for Tag Storage
Low	Up to 70 dozen	14	By Month
Moderate	Up to 350 dozen	70	By Week
High	More than 350 dozen	Up to 200	By Day

Sequential ordering of tags BY DATE RECEIVED/SERVED is strongly recommended.

- 24** Shellfish tags should be kept dry or protected from moisture and deterioration.
- 25** Stored shellfish tags should specify the date range of the tags by date used/served.
- 26** Premises not currently grouping shellfish tags based on the above time interval can upgrade their existing procedures with minimal effort by using an elastic band to bundle tags daily (if normal practice is to bundle weekly) then placing tags in the weekly container at the beginning of each morning shift or bundle weekly (if normal practice is to bundle monthly) then placing tags in the monthly container every Monday.

Recommendations for collecting information during illness complaints and investigations

- 27** Operator knowledge of the hazards associated with food products they serve should be improved.
- 28** During complaint and illness investigations, operators should ask complainants if they received a till receipt that described the variety of oyster eaten.
- 29** Premises with the capability of tracing information back to the customer order should be asked to provide:
- o Date and time meal was eaten
 - o Oyster varieties and quantities that were consumed
- 30** Premises that do not currently collect complaint information should implement a system to record customer complaints and illness incidents. All premises should report illnesses to their Health Authority.
- 31** Illness information collected by premises helpful to an illness investigation should be requested. Examples of information that can be requested include:
- o How many other meals of the same type were consumed
 - o Email contact for the consumer
 - o How many guests were in the group that included the complainant

Appendix 2. Symptoms associated with common shellfish illnesses in BC

Hyperlink to illness on BCCDC site	Vibrio parahaemolyticus	Hepatitis A	Norovirus	Paralytic Shellfish Poisoning	Amnesic Shellfish Poisoning	Diarrhetic Shellfish Poisoning
Diarrhea	✓		✓		✓	✓
Abdominal discomfort	✓	✓	✓		✓	✓
Nausea	✓	✓	✓	✓		✓
Fatigue		✓	✓			
Fever	✓	✓	✓			
Dizziness				✓	✓	
Vomiting	✓		✓	✓	✓	✓
Headache	✓			✓	✓	
Other	- Jaundice - Loss of appetite - Persons with liver conditions at risk for serious illness			MOST COMMON: - Numbness/tingling in mouth, face, hands, feet - Coordination problems, difficulty swallowing - In serious cases, paralysis, difficulty breathing & death	- Muscle weakness - Disorientation - Memory loss - In serious cases, seizures, coma, unstable blood pressure & death	Chills
Onset of Symptoms after exposure	4 to 96 hrs (typically 15 hrs)	within 15-50 days (typically 28-30 days)	within 12-48 hrs (typically 36 hrs)	within 15 min to 10 hrs (typically 2 hrs)	within 24 hrs	within 30 min to 12 hrs
Duration of Symptoms	1 to 7 days	Weeks	2-3 days	few hours to a few days	few hrs to a few days	Hours to 3 days

Note: If you are ill with food poisoning, you are advised to visit your physician. This table may not reflect all possible symptoms or illnesses associated with seafood

For more information and immediate help, call the **nurse line at 811**, or **Drug and Poison Info Line at 1.800.567.8911**

Appendix 3. Example food safety plan for oysters for raw consumption

Critical Control Point	Monitoring Step	Monitoring Frequency	Critical Limits	Action on Deviations
Step 1 – Receiving Oysters				
Product inspection – oysters from valid source	Product must be from approved source: a valid shellfish tag is received for each batch and lot of oysters (all oysters <u>must be</u> processed at federally registered establishments)	Each batch and lot of oysters	No exceptions	- Reject any lot without shellfish tag or invoice/receipt/fish slip with traceable harvest area information; - Record in receiving log
Product inspection – good quality	- Accept only clean, alive oysters with undamaged shells - Less than 10% should be dead	Each lot	>10% of product dead	- Reject lots with dead oysters - Record in receiving log
Temperature on receipt	Oysters must be received in ice and refrigerated at temperatures at or below 4°C	Each lot visually or with thermometer	≤4°C	- Reject lots in melted ice or above 4°C; - Record in receiving log
Step 2 – Storage of Oysters				
Storage Temperature	Oysters must be held refrigerated at or below 4°C	Daily with thermometer	≤4°C	- Divert to cooked product - Record cooler temperature on daily record sheet with actions to address issue
Step 3 – Preparation of Oysters				
Cleaning activities for live oysters	- Use only fresh, live oysters; - Use only potable water from an approved source to wash shells; - Use only clean and sanitized utensils to wash shells	Check shells are closed, or close when tapped	Each oyster	Discard dead oysters
Cleaning activities for re-used oyster shells	- Use only potable water from an approved to wash shells; - Use only clean and sterile utensils to wash shells; - Use only undamaged shells; Use either of these methods 1. clean, rinse, and sanitize shells (disinfect oysters shells with boiling water or approved sanitizer) 2. commercial sanitizing ware-washer	Each batch, check shell quality at end of cleaning	Each shell	Discard broken damaged shells

Temperature	- Minimize time out of temperature control before service to customers - Do not hold oysters at room temperature for longer than 60 minutes - Prepare oysters to order	Each time oysters are removed from refrigerator	< 60 minutes ¹	If held at room temperature for >60 minutes divert to cooked product, <i>OR</i> Discard
Step 4 – Display and Service of Oysters to Customers				
Display and holding temperature	Oysters must be displayed (or held) in refrigerators or in ice displays cold enough to maintain product at or below 4°C	<i>For product on ice:</i> - Visually check ice every 2 hours or as required <i>For product in refrigerator:</i> - Check temperature daily with thermometer	In potable ice or, ≤4°C	Divert to cooked product, <i>OR</i> Discard
Public warning	An advisory or menu statement warning consumers of the risks of consuming raw oysters is available	Weekly	Present at each location	Implement immediately
Step 5 – Record-keeping for shellfish tags				
Oyster service from batch for each variety of oyster	- Record date you begin serving oysters on the shellfish tag, invoice or in a log - Write date you finish serving oysters on the shellfish tag, invoice or in a log - Keep the tags for a minimum of 90 days	Each batch of a specific oyster variety	Each batch for each oyster variety	Implement immediately

¹ Based on FAO/WHO reference. FAO/WHO [Food and Agriculture Organization of the United Nations/World Health Organization]. 2011. Risk assessment of *Vibrio parahaemolyticus* in seafood: Interpretative summary and Technical report. Microbiological Risk Assessment Series No. 16. Rome. 193pp.
At 25°C, Vp log growth is 0.197 log₁₀/hr CFU/g, e.g., after one hour, Vp at 50 CFU/g would increase to 79 CFU/g

Appendix 5. Illnesses and complaints log

Note: if the person is ill advise them to contact their doctor or for immediate help to contact the nurse line at 8-1-1 or the poison control line at 1.800.567.8911 (24 hr service)

Date complaint received	Complainant (name)	Contact phone #'s (cell or work-daytime)	e-mail	Date and time meal eaten	No. of people who ate	No. of people who were ill
Description of the foods (name of shellfish if known) that were eaten in the group?				Signs and Symptoms of illness (date/time when 1 st ill and symptoms)		
How many of those foods were served that day to other consumers?		Other information				
Date referred to health authority						
Date complaint received	Complainant (name)	Contact phone #'s (cell or work-daytime)	e-mail	Date and time meal eaten	No. of people who ate	No. of people who were ill
Description of the foods (name of shellfish if known) that were eaten in the group?				Signs and Symptoms of illness (date/time when 1 st ill and symptoms)		
How many of those foods were served that day to other consumers?		Other information				
Date referred to health authority						

Appendix 6. BC Live Oyster Record Keeping Requirements



