Harvester Education for Safe Shellfish

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Why are we here?

For growers (dealers and wild harvesters have other rules)

To comply with FDA & ISSC rules

LEARNING OBJECTIVES:
DEM / ISSC harvest regs.
Vibrio risks and rules
Aquaculture-specific concerns
Outline

1. Overview of DEM / ISSC harvest regs.
2. Vibrio concerns
3. Specific Rhode Island Vibrio regs.
4. Working in the Commons
5. Aquaculture specific issues
General Harvest Regulations
DEM Chapter 14-2

- Permits and Licenses
- General Requirements
- Tagging
- Wild stock restrictions
DEM Permitting & Licensing

- **DEM Aquaculture License ($200)**
  Credit card - authorizes sale to a dealer only

- **CRMC Lease (assent or permit)**
  Grants limited exclusive use of leased area.
  Annual lease fee, Annual report required

- **Dealer License ($200)**
  Requires HACCP training, extensive record keeping, facility, allows sales to restaurants & individuals
DEM General Requirements

- Prevent contamination
  Boat and shellfish containers must be clean.
  Keep shellfish from contact with bilge water, fuel etc.

- Waste disposal prohibited

- No discharge of sewage, trash
  Porta-potty not required, but 3” labels required on sealed waste containers
  “WASTE ONLY”
General Requirements - Tagging

Tagging

- Critical violation!
- On a Harvester tag you must indicate start time when first shellfish breaks the surface
- One for each container
- Waterproof Tyvek
- Preprint your CRMC assent and lease #
DEM Harvest areas

- For wild harvest report DEM harvest area
- For Aquaculture use your lease or Assent #
- Check DEM site for changes
Regs say: Shellstock must be free of sediment

This is food, it is going in someone’s mouth
DEM General Requirements - wild stock

Only harvest cultured animals from your lease.

Tag all product before you leave your lease.

Don’t be in possession of wild product on your lease.

Don’t be in possession of wild and cultured product at the same time.
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Section 2. Vibrios

- Naturally occurring bacteria not associated with sewage or pollution
  - *Vibrio vulnificus*
  - *Vibrio parahaemolyticus* = V.p.

**Related to:**
- *Vibrio cholera* (sewage related, large outbreaks where sewage treatment is inadequate)
Vibrio vulnificus

- Rare – 90 cases in US annually
- Few infections outside Gulf of Mexico.
- Only serious for immune compromised individuals (liver failure, diabetes, steroids).
- Half of all illnesses from wound infections.
- **Half of all illnesses are fatal!**
- ~15 deaths a year from shellfish.
What about *Vibrio parahaemolyticus*?

- Sickens hundreds each year
- More common in higher salinity water when temps are over 75F
- Lots of wound infections
- Also traced to undercooked crab, shrimp and lobster!
- Illnesses more severe in immune compromised individuals
- Few mortalities attributed to Vp alone <1%
**Vibrio parahaemolyticus**

- Doubling time is 15-40 minutes at 90°F.
- Growth stops below 50°F degrees.
- Prompt refrigeration is effective.
- Temperature abuse is still a problem.
- Still appear to be a few cases where the levels at harvest are high enough to cause illness.
V.p. in oysters vs. other shellfish

- Why are the regulations different for clams or mussels?
- What do we know about V.p. in oysters?
- How does V.p. accumulate?
- Can we depurate V.p.?
V.p. Doubling Time

Keep it cool!

- 2148 minutes at 35 hr
- 434 minutes at 7 hr
- 181 minutes at 3 hr

Graph showing the relationship between degrees Fahrenheit and minutes.
Vibrio parahemolyticus growth at various temperatures

- 13 hours at 60°F
- 32 hours at 70°F
- 66 hours at 80°F
- 512 hours at 90°F
New strain of V. p. O4:K12

- Far more virulent
- Game changer – dozens of illnesses, bad press, closures and recalls, new regs.
- Tendency to blame others for abuse
Why are illnesses increasing?

- Warming waters and air temps.
- More oysters being eaten in summer.
- More reporting and better surveillance.
- People are less tolerant of food-borne illness.
- More susceptible consumers.
- New strain – higher attack rate
V.p. Control
Plans triggered by illnesses

- Shade - required
- Reduce time to temperature
- Harvest for shucking or Post Harvest Processing only
- Harvest area closures and recalls triggered by outbreaks

Pictures of shade and ice
Brief history of the FDA’s approach to Vibrio Management and the industry response

East Coast Shellfish Growers Association

PCSGA, GOIC
Industry Action

• Stop getting people sick!
• Aggressive education plan
  • Entire supply chain needs to improve temperature controls from farm to fork.
  • Immune compromised folks should not be eating any raw food – esp. oysters in summer.
• Peer pressure or enforcement to bring this home to the few bad actors.
“CHAIN OF CUSTODY” TEMPERATURE CONTROLS

Temperature abuse of shellfish can cause low numbers of vibrio present at time of harvest to multiply to dangerous levels. Therefore, it is important for growers to educate everyone who handles shellfish about the importance of temperature control. This includes dealers, wholesalers, truckers, retailers, foodservice workers and consumers. Everyone in this chain needs to be educated about the importance of keeping shellfish under temperature control at all times. Ask them about their protocol and what measures they have in place to assure strict compliance with temperature requirements.

TRANSPORTATION

Temperature data loggers can be used to track changes in temperature throughout the transportation process, allowing receivers to see if and when temperature abuse occurred during transit. Many dealers use them to tell whether shippers are abiding by temperature requirements. In the case of refrigerated trucks that are frequently opened to add other food items, ensure that shellfish are positioned so they stay cool during transport.

EDUCATE YOUR DEALERS AND BUYERS

Make sure your shellfish are handled properly as soon as they are turned over to the dealer. They can start the cooling immediately by spraying the shellfish with cold water. Don’t let the dealer delay putting your harvest into refrigeration, and ensure that they have proper temperature controls in place.

BE A SHELLFISH PROFESSIONAL

By working proactively to ensure that everyone in our industry is keeping shellfish cool we can reduce illnesses, keep harvest areas open and avoid additional costly regulations.

FOR MORE INFORMATION CONTACT:
East Coast Shellfish Growers Association
(401) 783-3360 or bob@ECSGA.org
Visit our website: www.ECSGA.org
or contact your state Shellfish Control Authority listed at www.ISSC.org

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Sea Grant
Rhode Island

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Woods Hole

From Harvest to Table
THE PERFECT SHELLFISH
Transporting Tips for Perfect Shellfish

#1 Shellfish should be thoroughly cold before going on the truck. Dealers should not rely on the truck’s refrigeration to bring shellfish temperatures down.

#2 Shellfish should be loaded into refrigerated trucks in such a way that they are not subjected to warm drafts when doors are opened and other items added.

#3 Freezing shellfish will kill them, but allowing shellfish to warm up can allow bacteria to multiply, making the shellfish unsafe to eat. The ideal temperature for shellfish is 40°–45°F.

#4 If utilizing ice or gel packs in styrofoam or waxed boxes in unrefrigerated trucks (intrastate), use adequate ice or packs to keep the oysters below 45°F for the duration of the trip.

#5 Upon reaching its destination, make sure shipments of shellfish are acknowledged and promptly placed into refrigeration.

Truckers should be aware that the FDA has issued new guidance in advance of public rulemaking to ensure the proper handling of food during transport.
Shellfish are delicious, nutritious and healthful — if handled properly. That means using appropriate time and temperature controls to slow or stop bacterial growth which will help reduce illnesses.

WHAT ARE VIBRIO BACTERIA?
Vibrio parahaemolyticus (Vp.) and Vibrio vulnificus (Vv.) are naturally occurring bacteria that proliferate during warm weather. Shellfish can concentrate vibrios as they feed and if the shellfish are eaten raw these bacteria can make your customers ill. Eating raw or undercooked shellfish when Vp. bacteria are present at high levels can cause flu-like symptoms known as gastroenteritis (diarrhea, vomiting, headache, fever and chills). Symptoms can sometimes require hospitalization. Even worse, if an immune compromised individual consumes shellfish contaminated with Vv. it may cause serious illness or possibly even death.

HOW TO REDUCE OR ELIMINATE ILLNESSES CAUSED BY VIBRIOs
Vibrio bacteria thrive at higher temperatures, and when shellfish are warm the bacteria can multiply at alarming rates. Temperature control is the best way to limit bacterial growth and ensure that producers deliver the safest possible product to consumers. Bacterial growth slows at low temperatures and stops altogether below 45°F.

To reduce or eliminate bacterial growth harvesters should take every precaution to chill their catch. Refrigeration immediately after harvest and throughout the chain of distribution — from wholesale to retail to final consumption — is crucial in assuring that shellfish arrive on the consumer’s plate in optimum condition.

POST-HARVEST TEMPERATURE CONTROL
The sooner shellfish are placed under temperature control (under 45°F) the better. “Harvest” begins at the time the first shellfish is exposed to the air, either on deck or when the tide recedes. At 80°F vibrio levels can double every hour.

ACHIEVING AND MAINTAINING TEMPERATURE CONTROL
Temperature can be controlled through mechanical refrigeration, icing, or the use of gel packs. Studies have shown that direct icing can reduce shelf life of clams, especially when growing waters are exceptionally warm, but a layer of cloth between the shellfish and ice can prevent this. Make sure that the container can drain so no shellfish are sitting in ice melt-water.

Regardless of the method of temperature control used, make sure that shellfish in the center of the container get cooled as well. Providing shade to keep shellfish out of the sun can make a big difference. Once the shellfish are landed you can cool them with a spray of cold fresh water from an approved source.

Each state has established harvest protocols to determine the hours of harvest and maximum time to refrigeration in order to minimize bacterial growth.

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How to reduce or eliminate illnesses caused by Vibrio: Harvest vibrio from below the thermocline, where temperatures are several degrees cooler than at the surface. Harvest vibrio before the tide goes out completely. Shellfish on exposed tidal flats can get very warm. Collecting shellfish in bags, baskets or cages, and then holding them submerged (preferably in cool, deep waters) until harvest. For this to work properly shellfish must be held in such a way that they can continue filtering water to allow themselves to purge accumulated bacteria. Watch for stray shellfish. When emptying cages or baskets be certain no strays get left behind!
Questions so far?

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RI Vp Control Plan


Effective July 1 – September 15

In “Thermally Impacted Areas”

- Harvest early (by 11AM)
- Or Harvest fast
  (to the dealer w/in 2 hours)
- Or bring ice (approved ice)
- Shade required
RI - VCP

In the bay you have 5 hours to refrigeration because Vp is less of a problem in cooler waters.

Still need shade.
Cooling Options

Ice slurry dips work best to cool shellfish quickly.

Ice bed is OK.

Reefer on truck is not designed to cool product.
Keep it cool

- Leave it in the water until the last minute
- If harvested inter-tidally - leave in the water overnight (for lease holders)
- Shade on the boat and in the truck
- Ice (approved)
- Get it to the dealer fast - make sure they put it right in the cooler.
- Talk to your dealer and your trucker
Be Creative
This is only a critical issue for a few months a year

- Ice, coolers, shade
- Swamp coolers
- Spray with cool water from approved source

- Ideas?

Questions?
A word about Norovirus

- Norovirus is the major source of food borne illness in the US. It is also HIGHLY contagious!
- Norovirus is not a major problem in U.S. shellfish because we do a good job with sewage treatment.
- Where we run into problems is usually overboard discharge: Typically a boater or harvester catches Noro from a family member and then vomits overboard - contaminating acres and acres of growing grounds.
- **IF YOU SEE SOMETHING SAY SOMETHING** - A brief precautionary closure is vastly preferable to dozens of illnesses, recalls and closures
Please support our research partners

- We have many challenges and unanswered questions.
- We need better tools.
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Working in the Commons

- You do not own your lease.
- Your actions reflect on everyone.
- If you make enemies, you make us all look bad.
- If you get someone sick and cause a closure you are hurting everyone.
- Stay on your lease. Work within your permit. Don’t break the law.
Working in the Commons  
Expectations and Responsibilities

Download the ECSGA Best Management Practices module  www.ECSGA.org

- Create a customized farm plan
- Generate marketing materials
- We have identified key do’s and don’ts
- Takes less than 15 minutes

Join the OSAA -

They work for you and they deserve your support
Expectations and Responsibilities

If you see someone else doing something that might cause an illness or reflect badly on the industry....

What will you do?

If an illness is traced to your growing area you could face a closure and recall.
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Seed Considerations

Seed imports
Must be approved by CRMC Aquaculture Coordinator
Must be inspected by pathologist for diseases and certificate should come in advance of shipment - Minimum 5-day lead time

No wild stock seed collection

Tips
Order seed early, order excess seed, order from multiple hatcheries or nurseries, consider disease resistant stocks, triploids, larger seed costs more, but small seed is tricky
Seed Considerations

Seed from RI - if from a different “zone”

Must still get approval from CRMC Aquaculture Coordinator w/ at least a 5-day lead time.

Must still be inspected by pathologist.

Cannot move from high infection zone to low infection zone.
Seed Considerations

From uncertified waters

Seed must be cultured in open waters for a minimum of 6-months prior to sale.

Requires extensive record keeping and an operational plan to ensure that seed is kept separate and is not sold prior to the end of the 6-month period.
If you have questions:

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ECSGA.org, ISSC.org, DEM.RI.gov