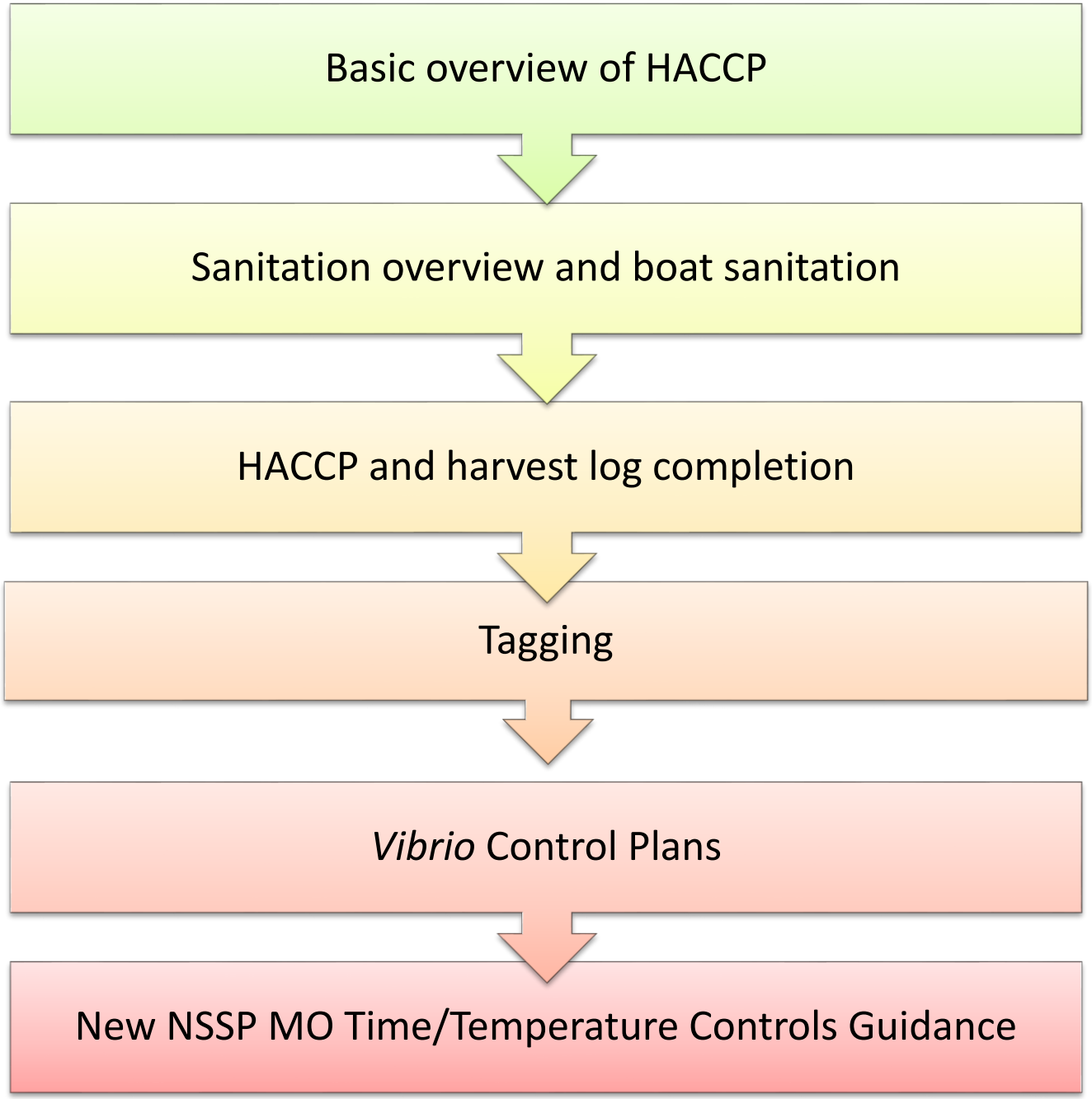
Boat Captains Seminar

Connecticut Department of Agriculture
Bureau of Aquaculture
and
Connecticut Sea Grant
March 15, 2012


Basic overview of HACCP
Sanitation overview and boat sanitation
HACCP and harvest log completion
Tagging
Vibrio Control Plans
New NSSP MO Time/Temperature Controls Guidance

HACCP –Why YOU Must Care

Since 1997, FDA has required that all seafood in the wholesale market stream be processed under a HACCP program (Title 21 CFR 123 Fish and Fishery Products)

The ISSC has incorporated HACCP into its Model Ordinance

All shellfish harvesters in Connecticut are licensed as dealers (unlike in many states), so HACCP begins on the boat

The responsibility for keeping the shellfish product (and consumers) safe begins with YOU

HACCP Overview

- Hazard Analysis and Critical Control Points
- Food safety management program
  - Identify food safety risks
  - Put controls in place and boundaries around the controls
  - Monitor the boundaries to ensure safety
  - Keep records, fix problems
- Two parts - Sanitation & HACCP
  - BOTH parts include the boat(s)

Food Safety Hazards

Biological

- **Pathogenic bacteria ☑**
- **Viruses ☑**
- Parasites ☒

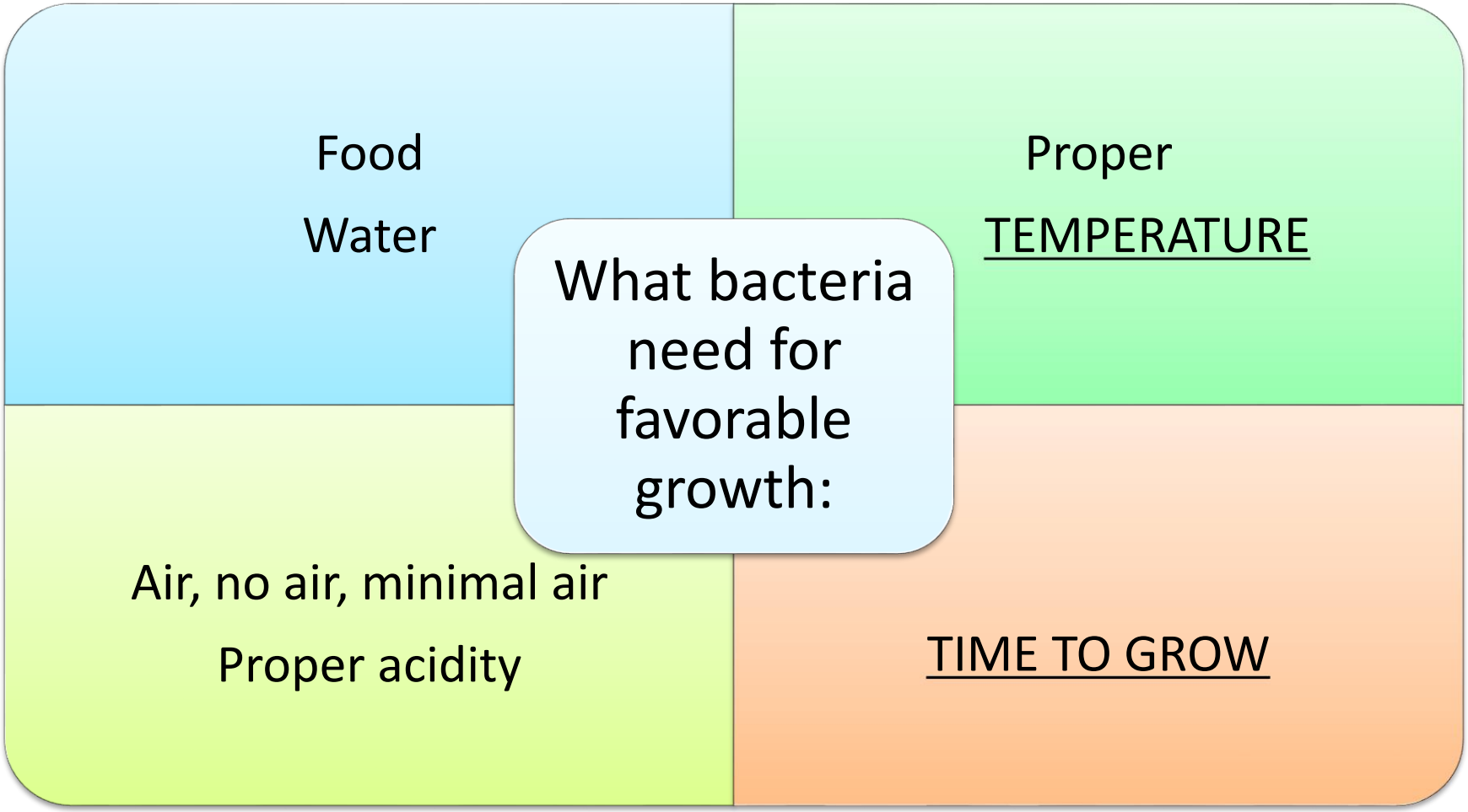
Chemical

- **Natural toxins ☑**
- **Environmental (including boat) ☑**

Physical

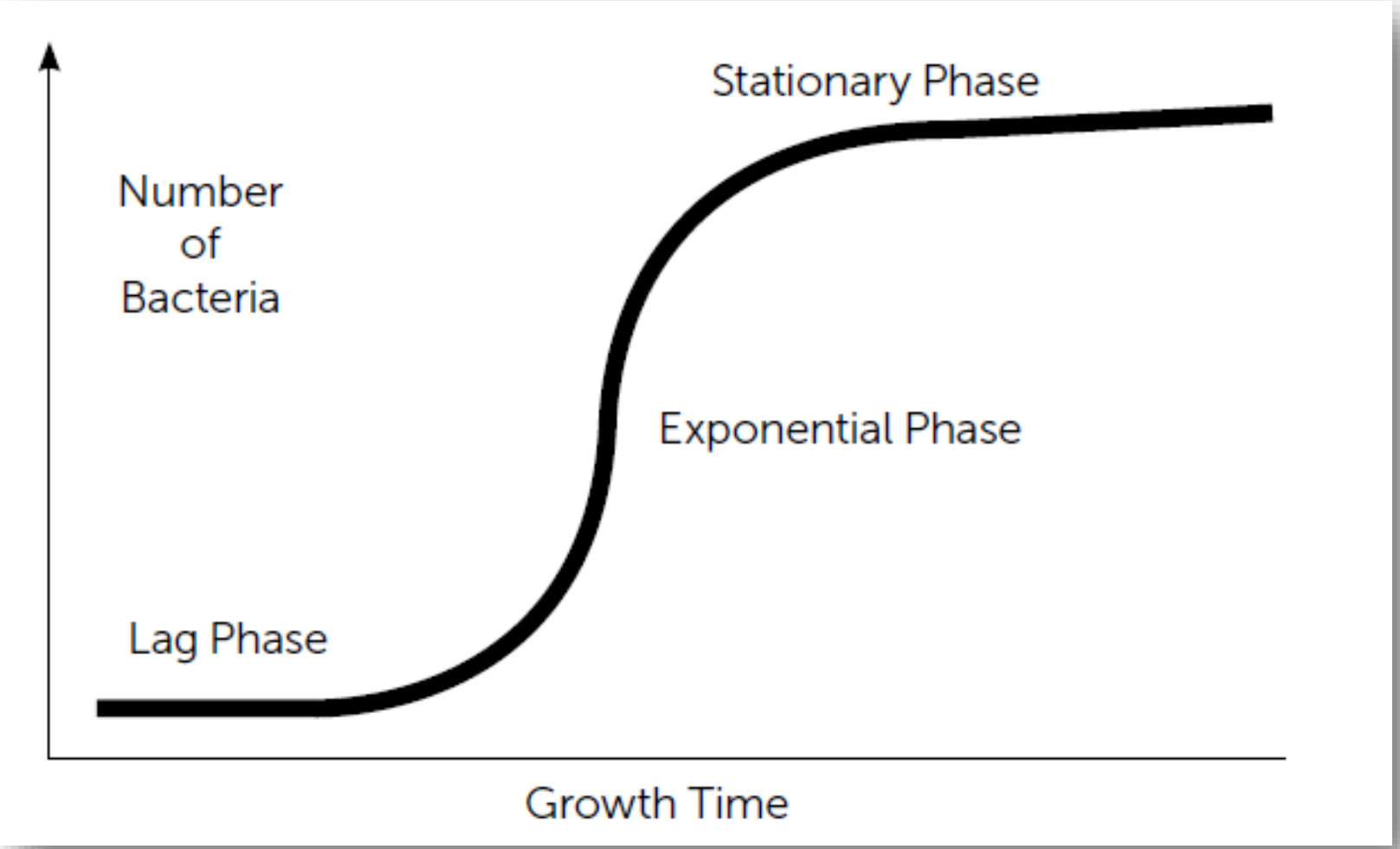
- Metal ☒
- Glass ☒
- Plastic ☒

Biological Hazards - Bacteria



Use their “needs” to determine control strategies

Bacterial Hazards



Vibrios, Salmonella, Shigella, E. coli, Listeria, etc.

Biological Hazards - Viruses

Hepatitis A
Norovirus

Need suitable host in which to grow

Do not require food, air, water to survive

Spread via poor hygiene - fecal/oral

Do not cause spoilage

Survive in human intestines, water or food for months

Heat resistant

Eating raw or steamed clams & oyster

Sewage, unapproved waters

Chemical Hazards – Natural

Marine biotoxins- toxic algae

Paralytic shellfish poisoning (PSP)- In CT and NY	Diarrhetic shellfish poisoning (DSP)	Neurotoxic shellfish poisoning (NSP)	Amnesic shellfish poisoning (ASP)/Domoic Acid

↓

Concentrate in shellfish tissues

↓

Heat Stable: Not inactivated by cooking

↓

Controlled by Harvesting ONLY in Approved areas

Chemical Hazards - Unintentional

Cleaners & Sanitizers used on boat

Fuel

Oil

Lubricants

Heavy metals
Environmental Contaminants

HACCP Program

Sanitation – provides a clean and sanitary environment in which food handling and processing can take place – focus on 8 key areas

HACCP Plan – addresses specific food safety hazards due to the species of seafood involved or the process it is undergoing

Both are equally important, but HACCP builds on sanitation

Shellfish Sanitation Operating Procedures (SSOPs)
Sanitation Audit Forms - 8 Sanitation Items

1. Safety of Water for Processing and Ice Production

Water supply Approved tested potable water source (for mixing with sanitizing agent)	Water from growing area in the Approved classification used to wash shellstock	Check for backflow prevention (HOSE BIB VACUUM BREAKERS) on all threaded spigots.	Check plumbing and related facilities. Check for prevention of cross-connections, backflow and back siphonage

2. Condition / Cleanliness of Food Contact Surfaces

Food Contact Surface-Ice shovels, Ice scoop, bins, ice machines and **shellfish contact surfaces** : smooth, easily cleanable

Cleaned, sanitized, good condition, properly stored. **Sanitize prior to start up of activities or if necessary during operation if surfaces become contaminated**.

Shellstock bags are to be stored in an manner to protect from contamination.

Sanitizer: RECORD the number concentration on each entry

Chlorine 100-200 ppm

Iodine 25 ppm

Quaternary Ammonia 200 ppm

Test Kits provided and used to check solution

Make sure you have the proper test kit for your sanitizing agent

2. Condition / Cleanliness of Food Contact Surfaces *(continued)*

Cull tables, pallets for storing shellstock

Ice shovels stored incorrectly, near splash zone near to floor, not stored to be protected from contamination

No Sanitizer Available or Sanitizer Concentration is insufficient, too weak

Dirty Ice bin or Ice Machine chute

Dirty Ice shovels

3. Prevention of Cross Contamination

Shellfish held outside not protected from contamination

Insufficient spatial separation from finfish, crabs, lobsters, etc.

Employees not washing and sanitizing their hands after returning from break or smoking

4. Maintenance of Hand Washing, Hand Sanitizing and Toilet Facilities

Toilet paper, paper towels, hand sanitizer, etc… hot water that is 100°F (42.4°C)

Keep these facilities clean and functioning properly. Don’t store toilet paper on top of toilet paper dispenser.

5. Protection from Adulterants

Cooler condensate; light fixtures, skylights or other glass suspended over food processing/storage areas; hydraulic fluids; rust, etc…

No reusing shellstock bags (only new clean bags to be used).

Adequately ventilated areas for storage/processing to remove noxious fumes, condensate, etc…

Any visible contaminants in the ice supply (dirt, rust, etc…) mold.

Condensate from ceiling or condenser in cooler storage area

Food or beverage containers stored in or on the ice supply

6. Proper Labeling/Storage/Use of Toxic Compounds

Keep insecticides and rodenticides, (for boats) hydraulic oils, gasoline, diesel, etc.. separate from caustic acids, metal polishing chemicals, etc.

Toxic compounds stored separately from detergents, sanitizers and related cleaning agents

Do not store above food contact surfaces or stored shellfish. Make sure all are labeled accordingly

Provide a test kit or other device that accurately measures in parts per million the concentration of the chemical sanitizing agent in use

KEEP chemical sanitizing agent and detergents stored separate from all other toxic chemicals, acids, oils, fuel, etc.

No label on sanitizer bottle

No Test Kit or other device available to accurately measure the concentration of the chemical sanitizing agent during inspection

7. Employee Health

No sick employees handling food. Assign to other duties.

8. Exclusion of Pests

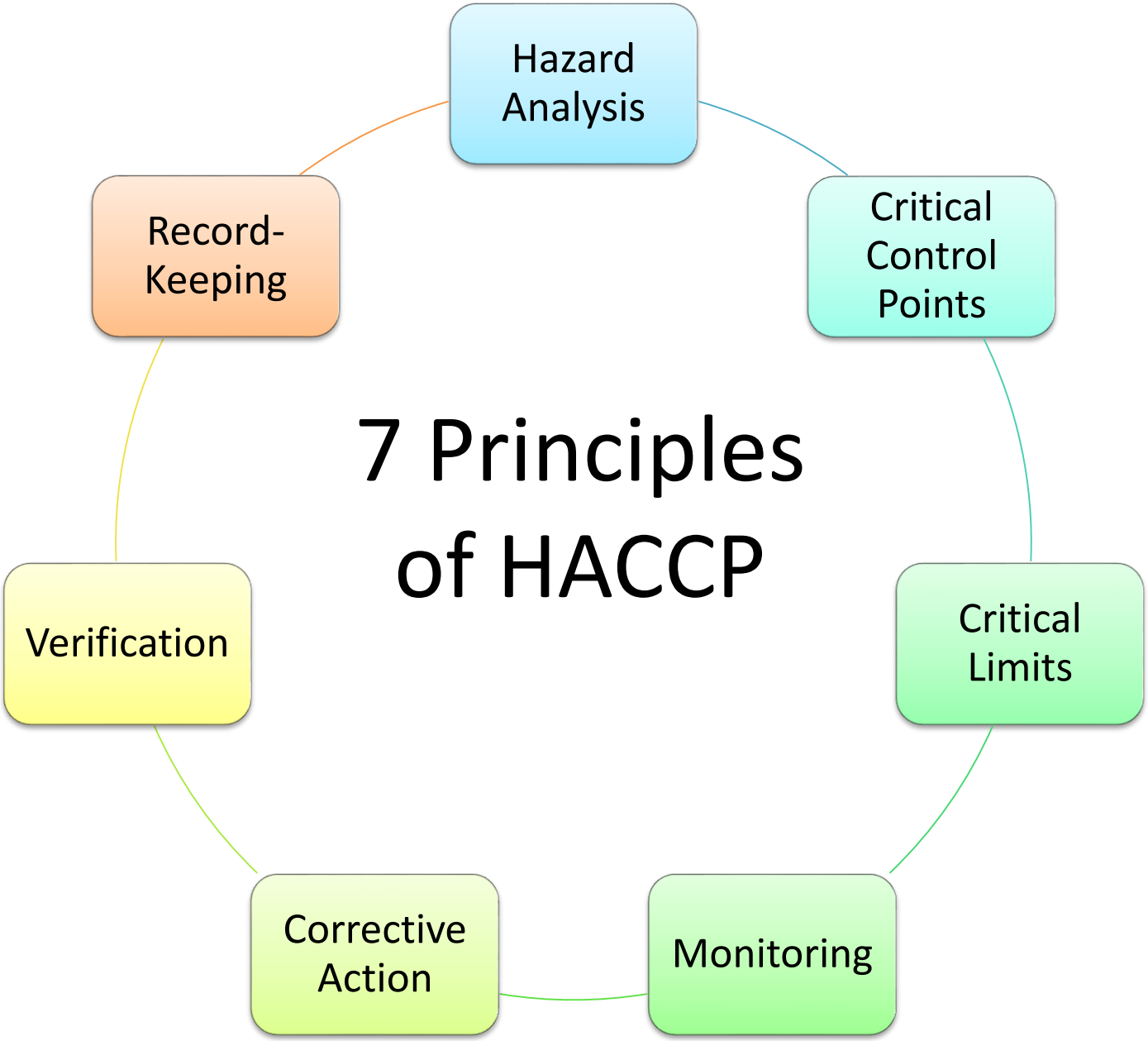
The facility shall be operated in a manner to assure that pests (rodents, insects, etc..) are excluded from the facility and processing activities.

No animals allowed (dogs, cats, birds, etc…) in facility or on boat.

Item #16 SSOP Audit form. Monitors all above 8 items. Fill out daily during operating days, harvest days.

NSSP Standardized Shellfish Processing Plant Inspection Checklist

Agency Name:						Date:	
Type of Inspection: ☐ Certification ☐ Pre-operational ☐ Routine ☐ Follow-up ☐ Standardization							
Dealer Name:						Certification Number:	
Dealer Address:							
	Hazard Analysis Critical Control Point (HACCP)						
1.	**HACCP Plan:** Yes ☐ No ☐ Required for Certification						
2.	Plan Elements Identified and Adequate	✓/✗ NA	Code			✓/✗ NA	Code
	(a) Hazards		O	(e) Critical Control Points			K
	(b) Records		O	(f) Monitoring			K
	(c) Critical Limits		K	(g)Verification Procedures			O
	(d) Name, Address, Signed and Dated		O	(h) Corrective Action if identified			K
3.	**HACCP Training:** Yes ☐ No ☐	Code O					
4.	**Plan Implementation**	**Corrective Actions Recorded (K)** **Verification Procedures (K) (Signature)** **Monitoring Procedures (K)** **Records: Accurate/ Maintained (K) Format (O)** **Initialed/Dated (O)** **Firm's Name on record (O)**				✓/✗ NA	Code
	(a)	Receiving					
	(b)	Shellstock Storage					
	(c)	Processing					
	(d)	Shucked Meat Storage					
	(e)	Other Critical Limits					
5.	Approved Source Control Failure						C
6.	Time/Temperature Control Failure						C
7.	Other Critical Control Failure						C
	Sanitation Items				**Citation**	✓/✗	**Code**
8.	Safety of water for processing and ice production				.02A		
9.	Condition and cleanliness of food contact surfaces				.02B		
10.	Prevention of cross-contamination				.02C		
11.	Maintenance of hand-washing, hand sanitizing, and toilet facilities				.02D		
12.	Protection from adulterants				.02E		
13.	Proper labeling, storage, and use of toxic compounds				.02F		
14.	Control of employees with adverse health conditions				.02G		
15.	Exclusion of pests				.02H		
16.	Sanitation Monitoring and Records				X.02		S(K/O)
	Additional Model Ordinance Requirements				**Citation**	✓/✗	**Code**
17.	Plants and Grounds				.03A		
18.	Plumbing and related facilities				.03B		
19.	Utilities				.03C		
20.	Disposal of other waste				.03D		
21.	Equipment condition, cleaning, maintenance, and condition of non-food contact surfaces				.03E		
22.	Shellfish storage and handling				.03F		
23.	Heat shock				.03G		
24.	Supervision				.03H		
25.	Transportation (To include only the person shipping)				IX.05		K
26.	Labeling and Tagging				X.05, .06, .07		S (K/O)
27.	Shipping Documents and Records / Written Recall Procedures				X.08, .03		K
Dealer's Signature:				**Inspector's Signature:**			


Hazard Analysis
Critical Control Points
Critical Limits
Monitoring
Corrective Action
Verification
Record-Keeping
7 Principles of HACCP

Conduct hazard analysis and identify prevention or control measures – *how can you prevent, eliminate, or minimize the potential hazard?*

Identify critical control points (CCP) – *where best to control hazard?*

Determine critical limits – *set boundaries on the control*

Monitor each critical control point – *are you within the set boundaries?*

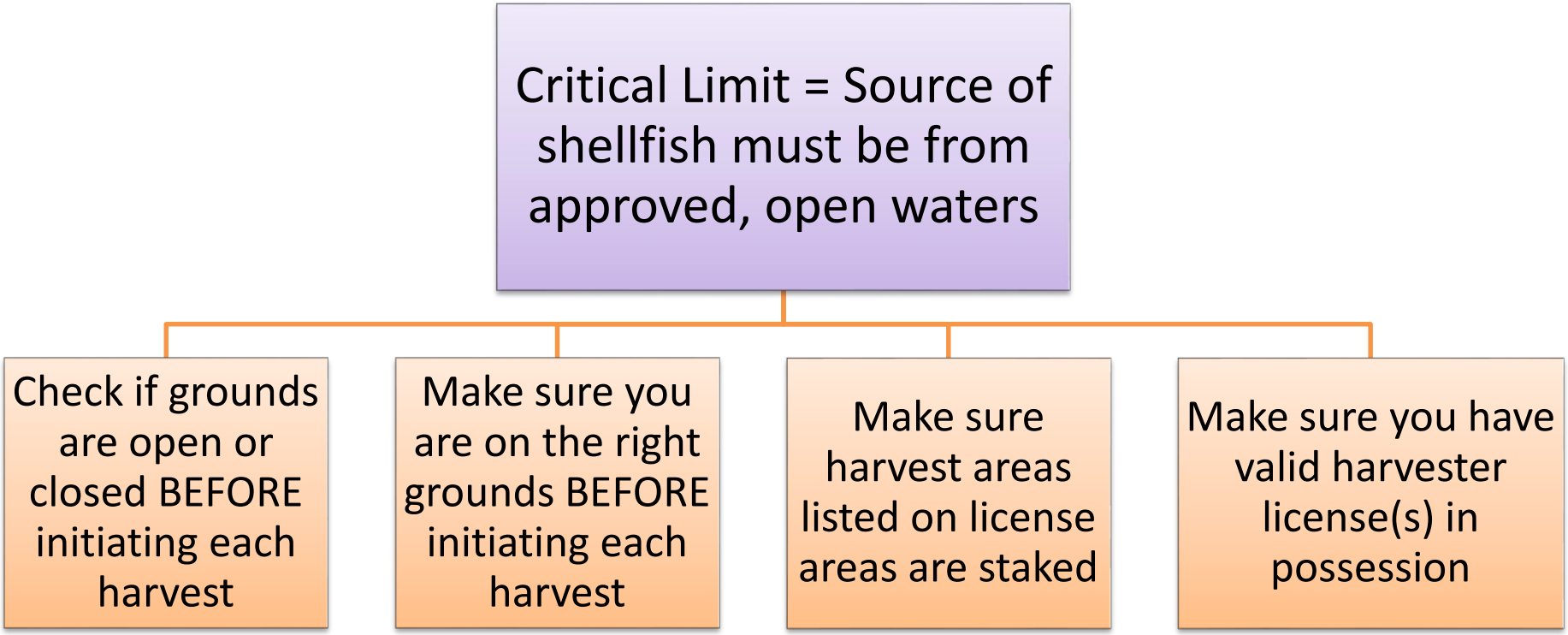
Establish corrective action - *if monitoring or record review reveals a problem, when and how was it fixed?*

Verification of the HACCP plan – *will it control hazards sufficiently as written and are you following the plan as it is written?*

Recordkeeping for critical control points, corrective action and verification – *Proof that you are operating in manner that is producing as safe seafood product as possible (CYA)*

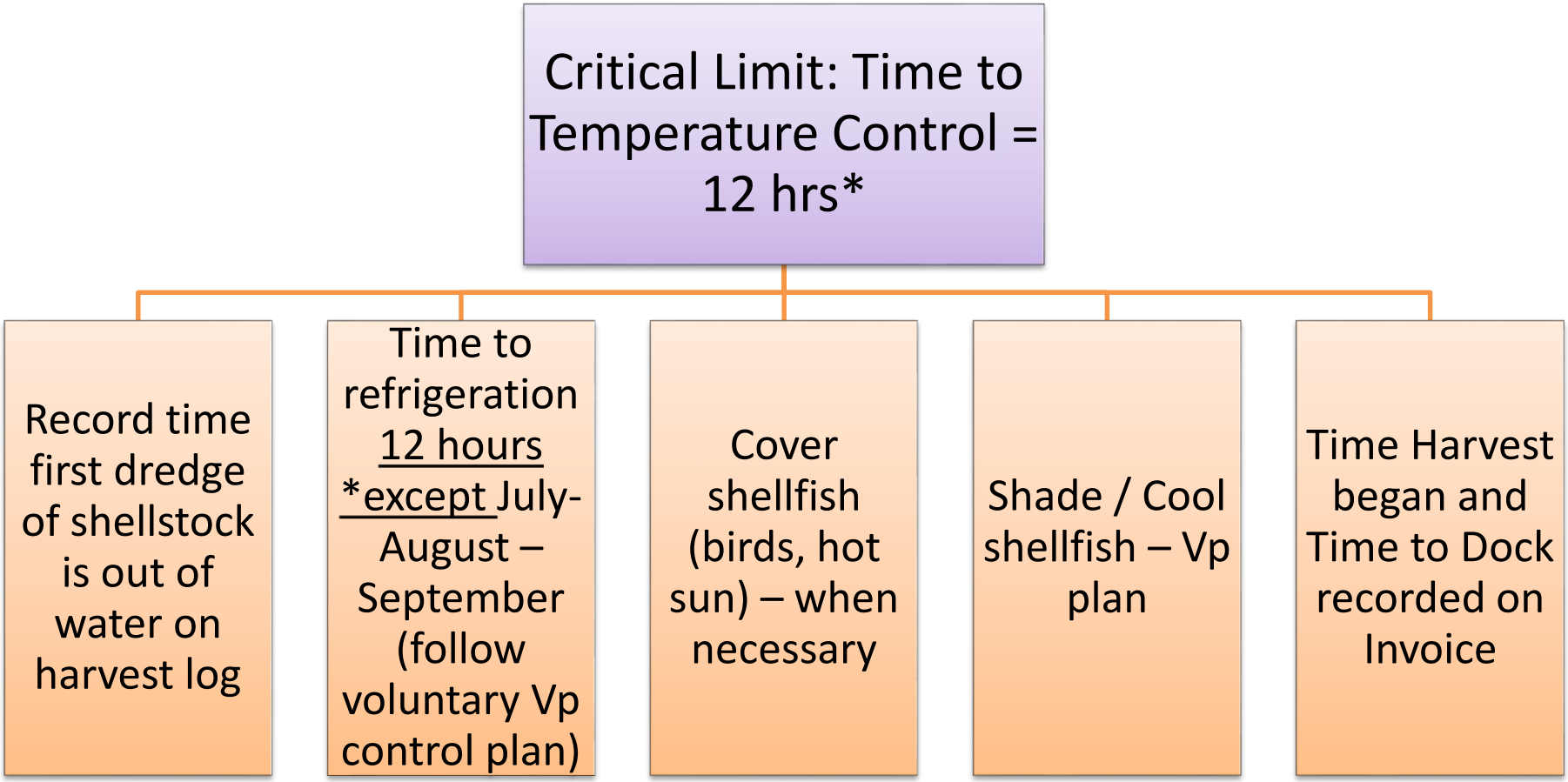
HACCP Before Harvest Begins:

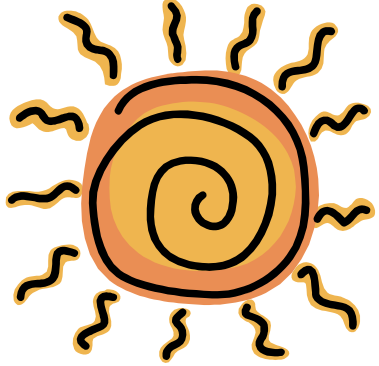
Significant hazard is PRESENCE of bacteria, viruses, natural toxins, environmental chemicals



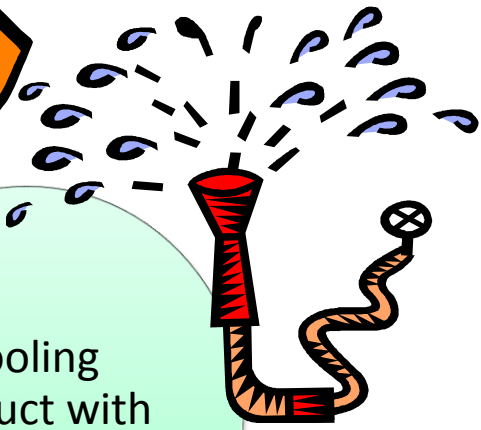
HACCP After Harvesting Begins

Significant hazard is bacterial GROWTH





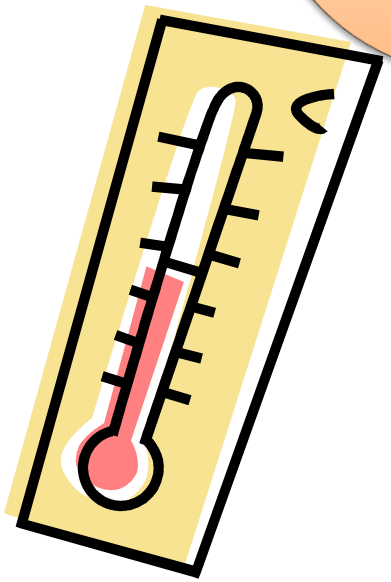
Shading product onboard vessel (can reduce temps by 10°F)



Cooling product with harvest water

In CT we are asking harvesters to abide by voluntary Vibrio Control Plans

Monitor cooling of shellstock to ensure that temperature brought down to 50°F within 10 hours

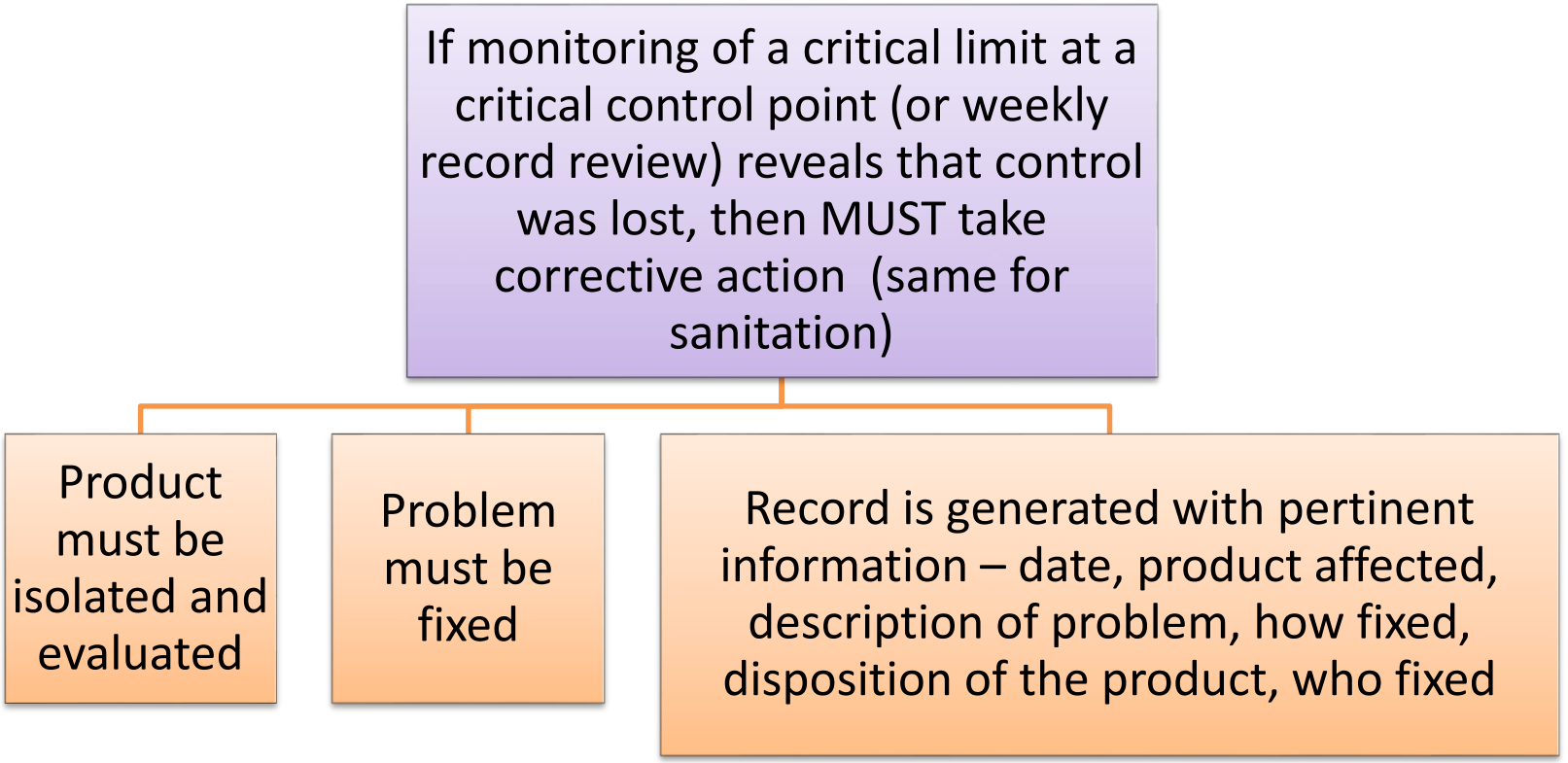


Monitor temperatures of shellstock while onboard vessel

Minimize time from first harvest to refrigeration

Date												
Start Harvest												
End Harvest												
Harvest Area												
Conditional Harvest Area												
Checked and Status (circle)	OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED	
Approved Harvest Area												
Checked and Status (circle)	OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED		OPEN/CLOSED	
Species												
# Bags												
Time Arrived at Dock												
	Sold To	Time Sold	Sold To	Time Sold	Sold To	Time Sold	Sold To	Time Sold	Sold To	Time Sold	Sold To	Time Sold
Sold to Whom												
Time Refrigerated												
Name of Boat Capt. And Initials Daily												

Corrective Action – What if you “mess up”?

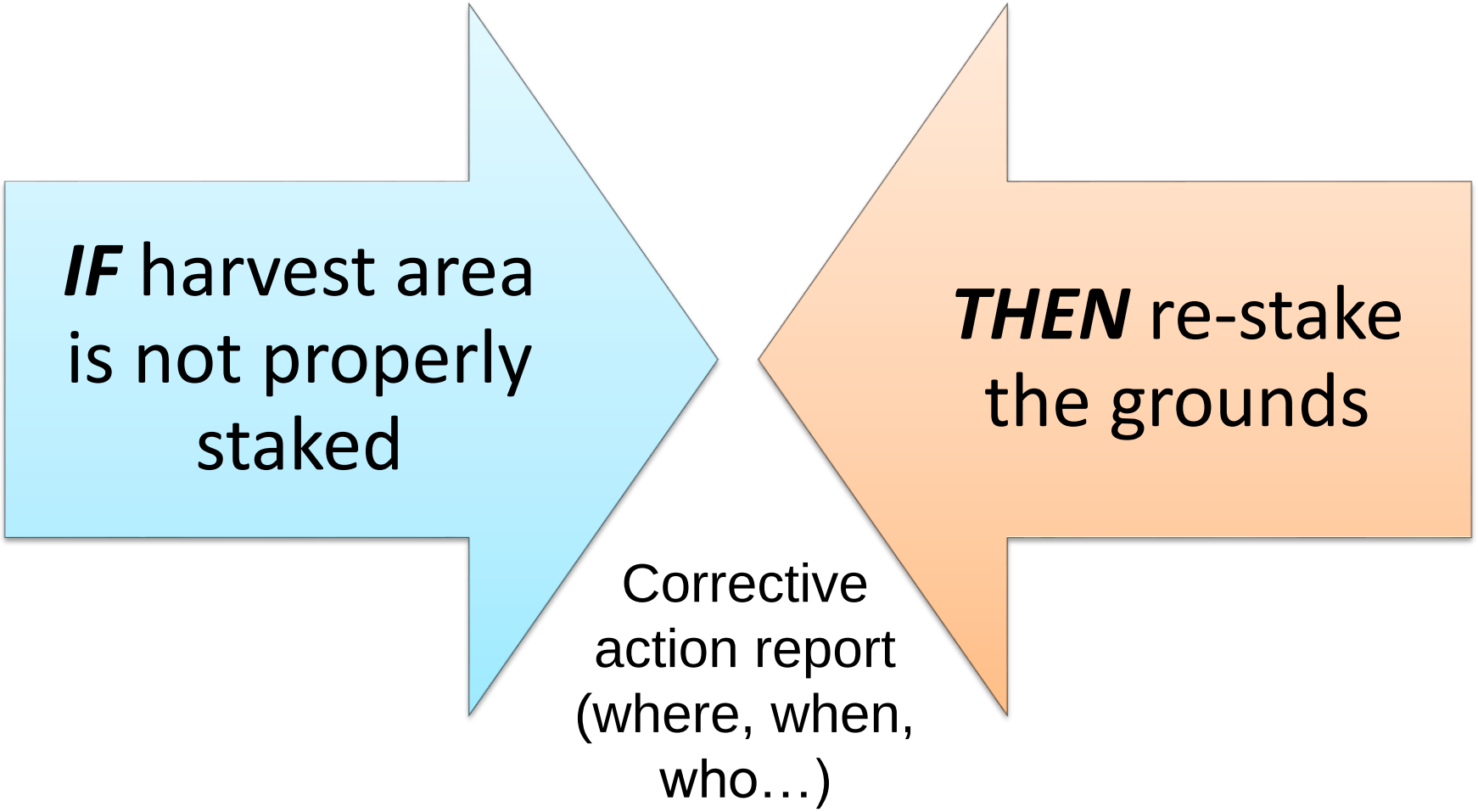


Corrective Action

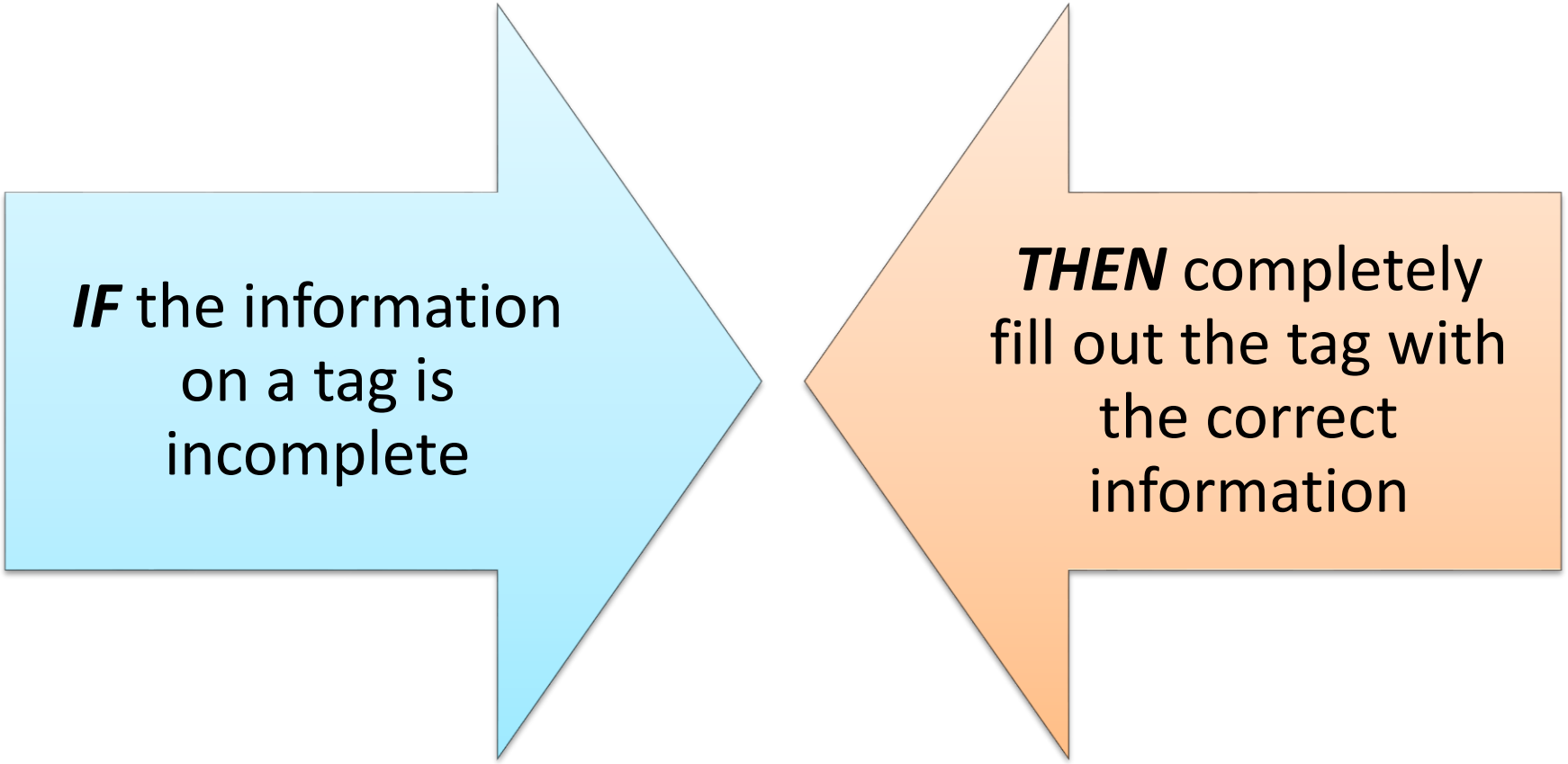
IF you forgot to call to check the status of a conditional area that you are working in, and it turns out that the area was closed

THEN contact HACCP trained person and/or Bureau of Aquaculture to report error. Shellfish harvested from an area that is closed must be replanted on those same grounds or recall product.

Corrective Action



Corrective Action



Corrective Action

IF boat does not return to dock within harvest window (12 hours or per Vp control plan in July, August, September)

THEN check temperature of shellstock? Return shellstock to grounds? ***Confer with DA/BA!!***

Corrective Action

IF the shellstock is not sold (picked up) or refrigerated within two hours of docking

THEN check the temperature of the shellstock? Return the shellstock to the grounds? Put it in refrigeration?

Confer with DA/BA!!

NSSP-MO Requirements
Labeling and Tagging

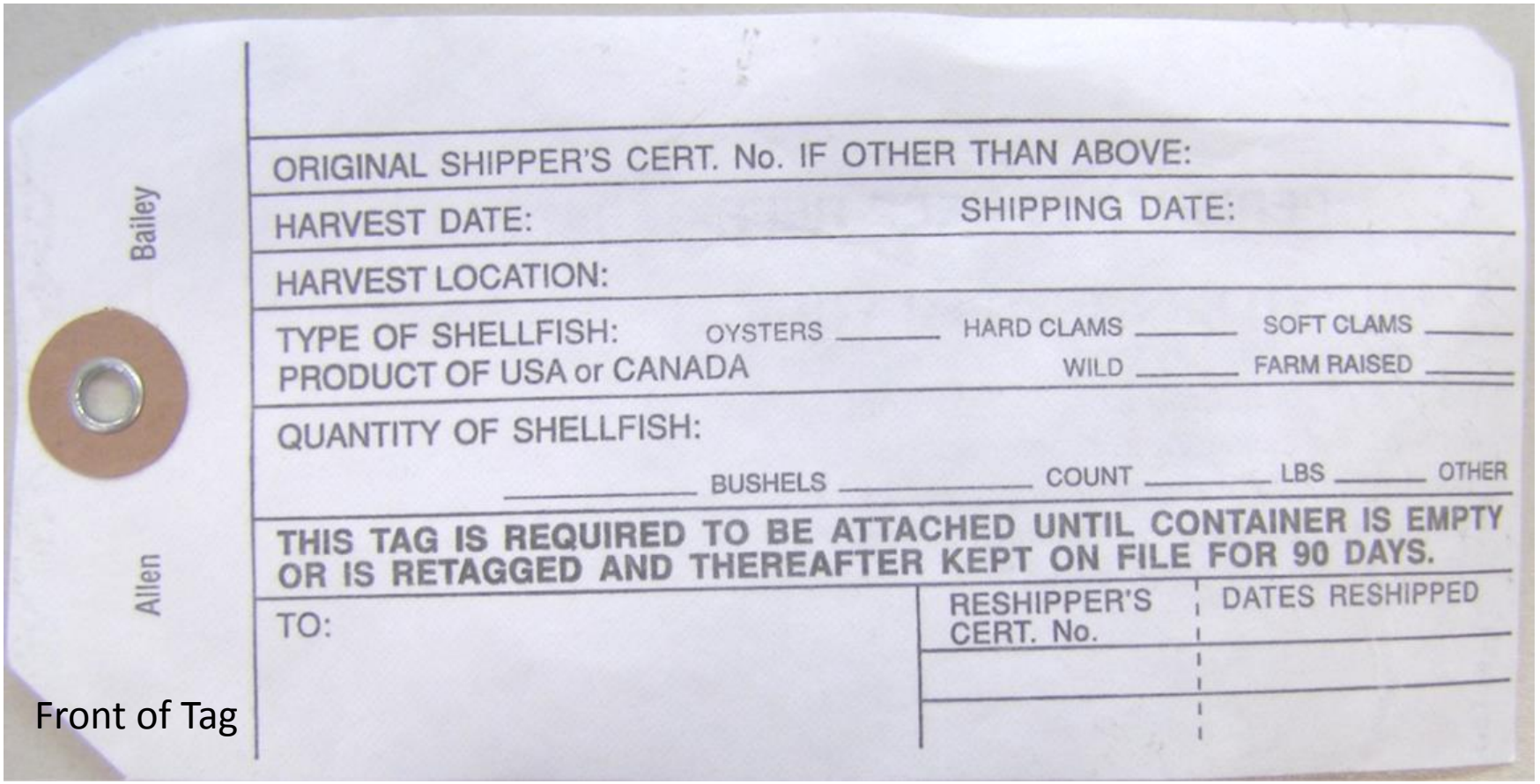
This item refers to the information required for shipping shellstock, shucked shellfish and for identification during intermediate processing.

The purpose of the tag or label is to facilitate product traceability.

The tag or the label shall be of proper size, waterproof and contain all the information specified in the NSSP-MO.

Labels shall be legible, contain all information required by the NSSP-MO and shall comply with the Federal Food Drug & Cosmetic Act (FFDC Act), the Fair Packaging and Labeling Act (FPLA) and Title 21 of the Code of Federal Regulations (21 CFR) Parts 101 and 161.

SHELLSTOCK TAG TEMPLATE



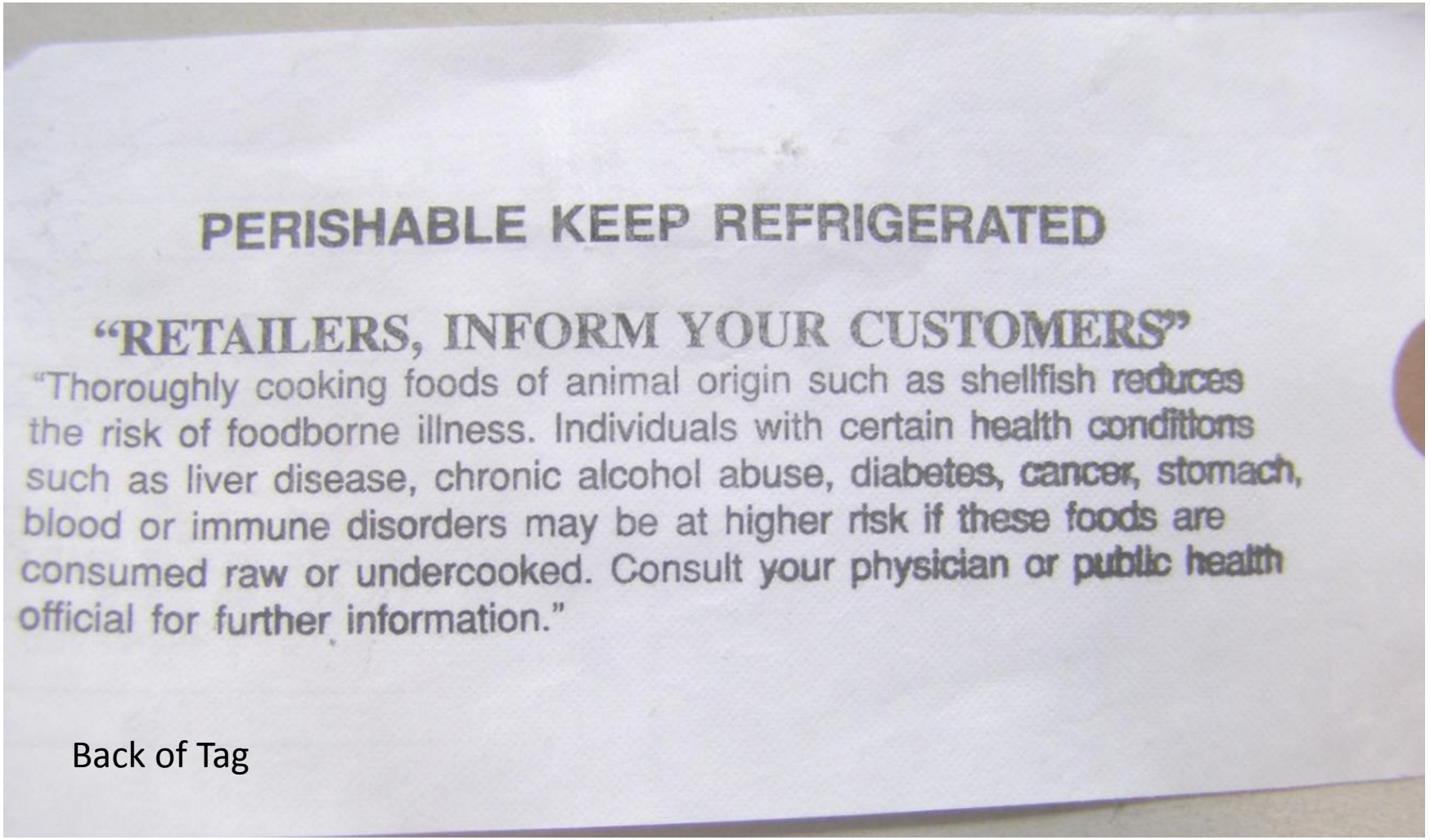
Front of Tag

The dealer's name , address and Certification number is to be located at the top of the tag

Also Harvest Date and Shipping Date

Harvest Location: Add CT_____

SHELLSTOCK TAG TEMPLATE



Back of Tag

Common Deficiencies

Incomplete, Illegible, Incorrectly completed tags

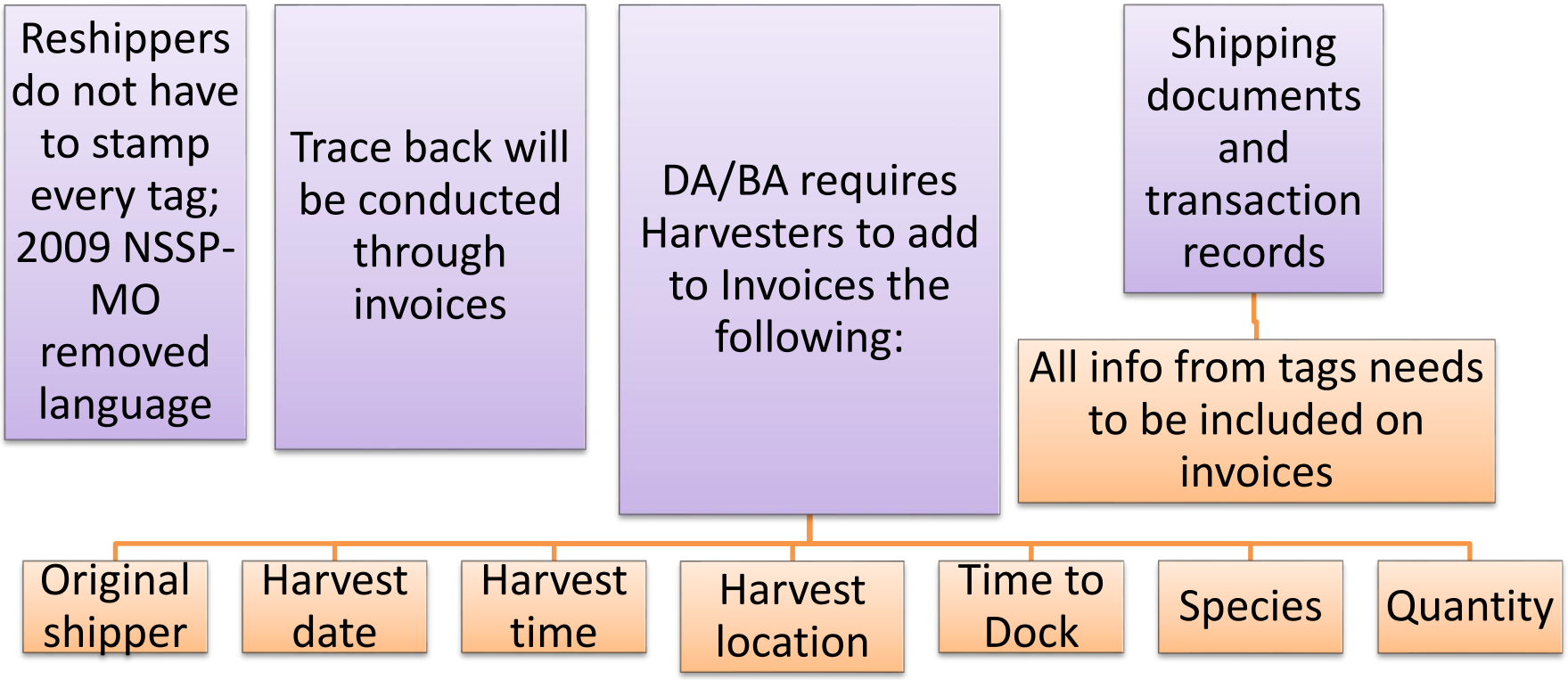
Labels which are Illegible because of the type of ink, lack of durability, etc.

Original Shipper certification number not on tag

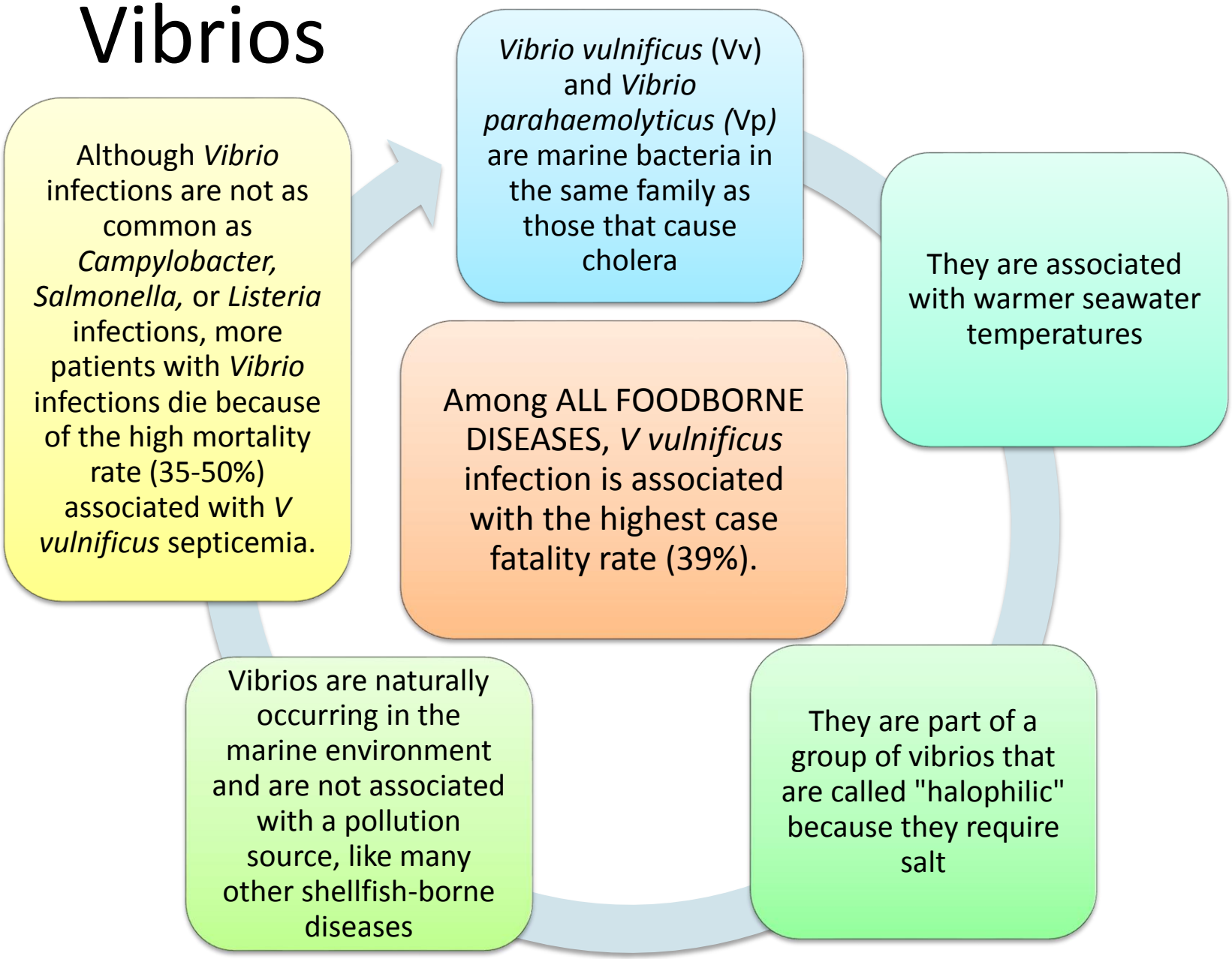
No date shucked (or sell-by date) on containers of shucked shellfish

Incorrect Harvest Location

NSSP-MO Changes – Invoicing



Vibrios



Source http://emedicine.medscape.com/article/232038-overview#a0199

Foodborne Illness Rates 1996-2010

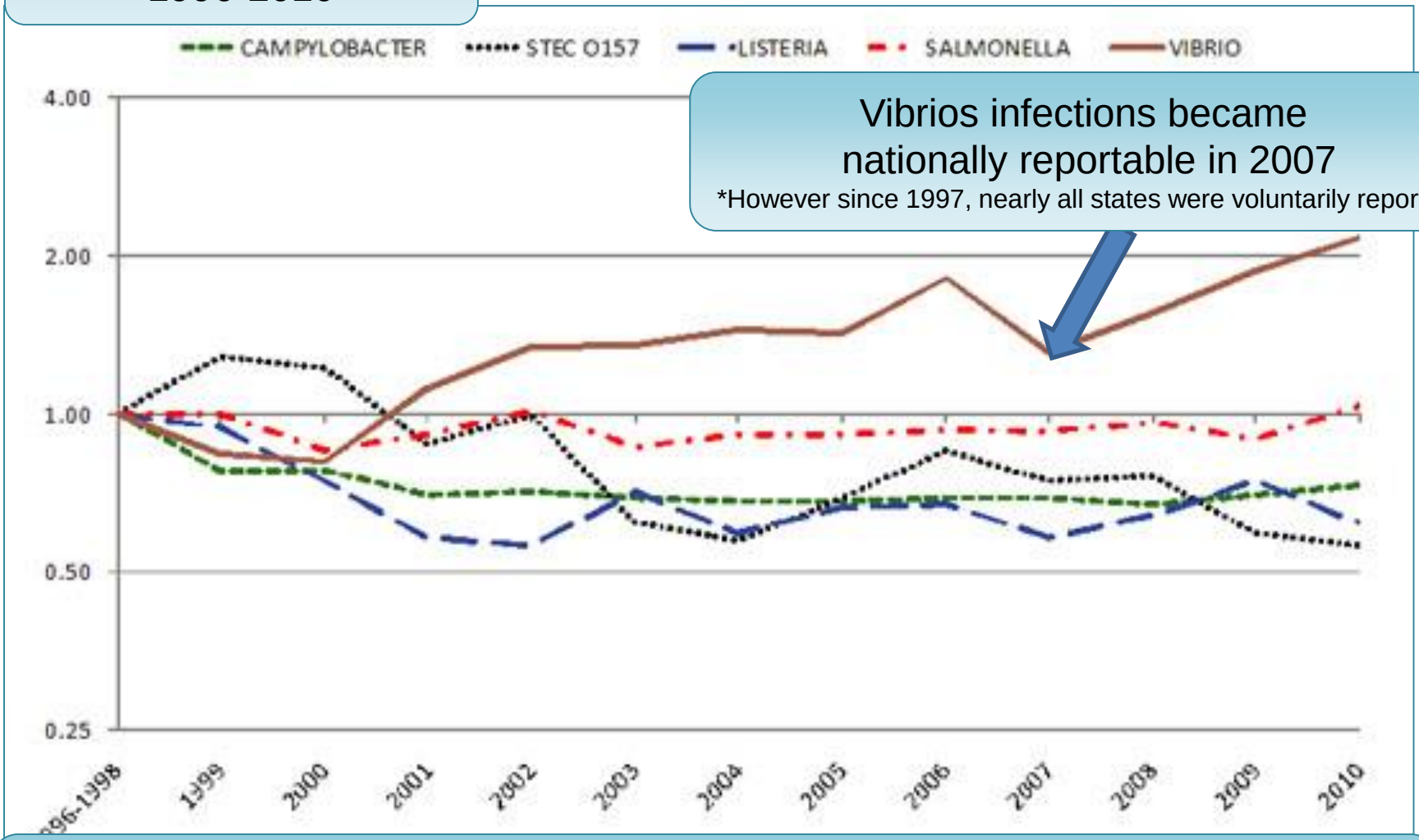


Figure 1. Relative rates of laboratory-confirmed infections with *Campylobacter*, *E. coli* O157, *Listeria*, *Salmonella*, and *Vibrio*, compared with 1996--1998 rates, by year --- Foodborne Diseases Active Surveillance Network, United States, 1996--2010*
http://www.cdc.gov/foodborneburden/trends-in-foodborne-illness.html

Changes in Confirmed Bacterial Infections 1996 vs. 2010

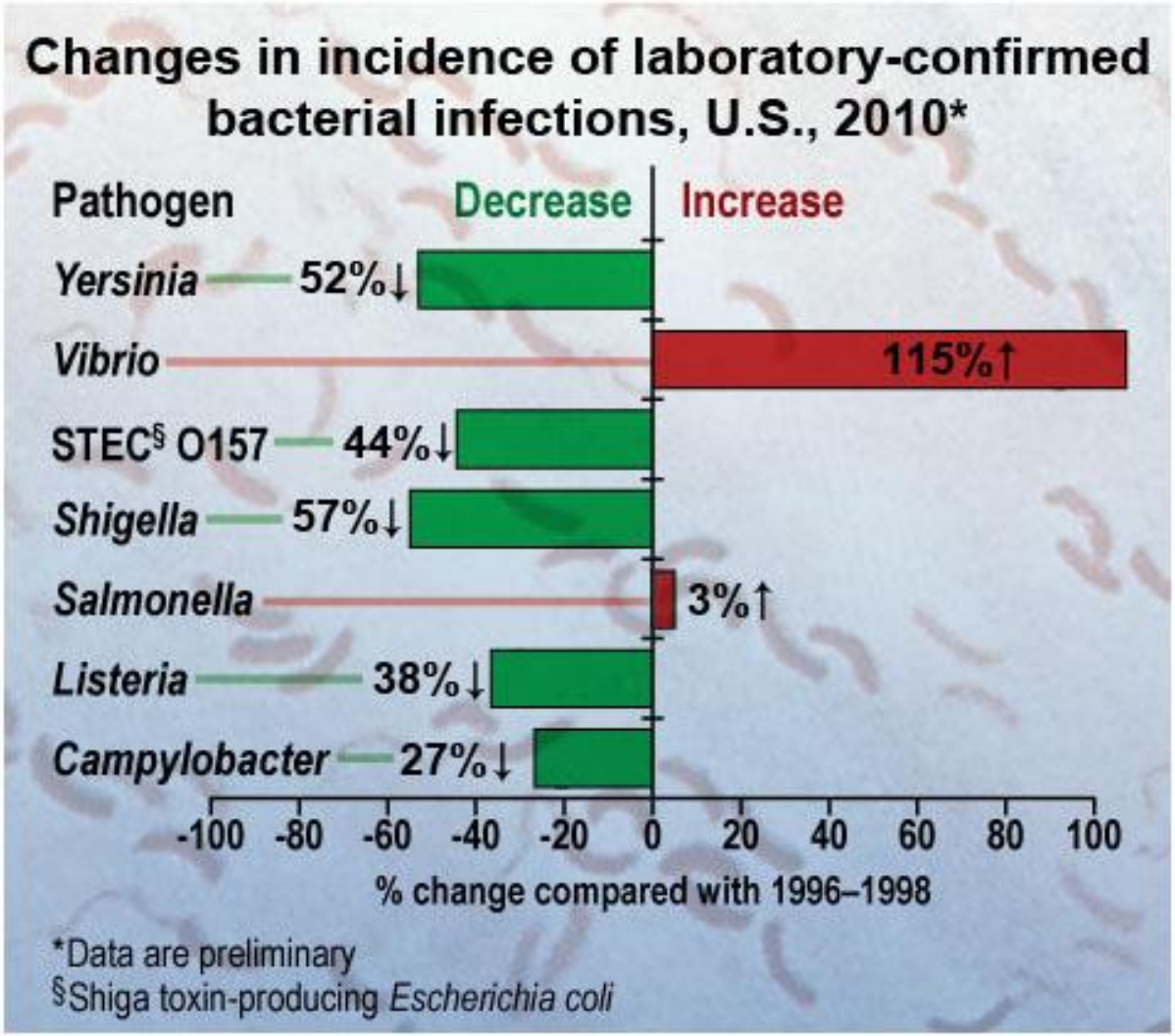


Figure 2. Changes in incidence of laboratory-confirmed bacterial infections, United States, 2010 compared with 1996–1998
http://www.cdc.gov/foodborneburden/trends-in-foodborne-illness.html

What type of illness does *V. vulnificus cause?*

Among healthy people, ingestion of *V. vulnificus* can cause vomiting, diarrhea, and abdominal pain

In immunocompromised persons, particularly those with chronic liver disease, *V. vulnificus* can infect the bloodstream, causing a severe and life-threatening illness characterized by fever and chills, decreased blood pressure (septic shock), and blistering skin lesions

Persons who are immunocompromised are at higher risk for invasion of the organism into the bloodstream and potentially fatal complications

V. vulnificus can cause an infection of the skin when open wounds are exposed to warm seawater; these infections may lead to skin breakdown and ulceration

V. vulnificus bloodstream infections are fatal about 50% of the time


Vibrio vulnificus
Lesions


Vibrio vulnificus
Necrotizing
fasciitis
A
B

What type of illness does *V. parahaemolyticus cause?*

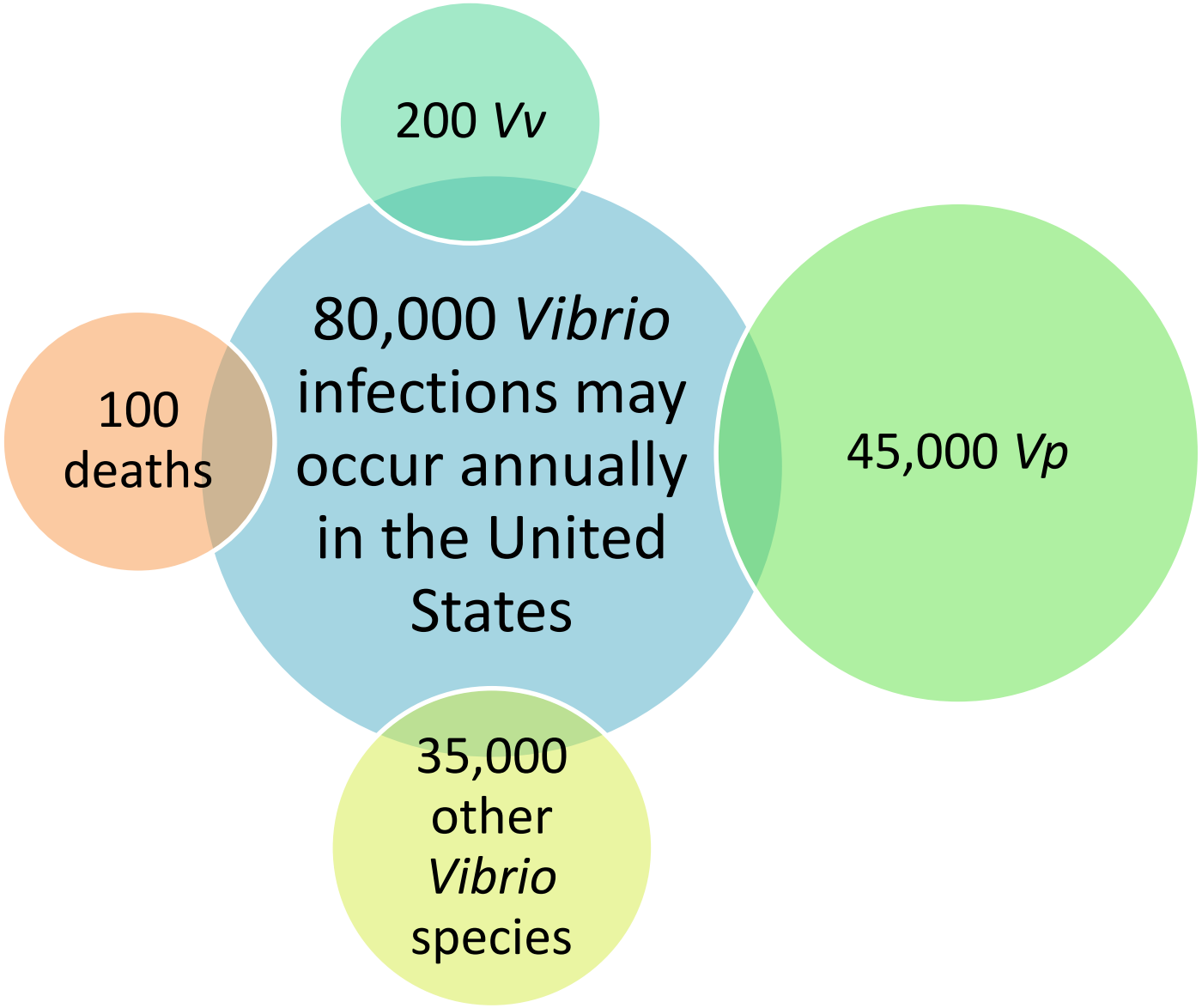
When ingested, *V.p.* causes watery diarrhea often with abdominal cramping, nausea, vomiting, fever and chills.

Usually these symptoms occur within 24 hours of ingestion.

*V.p.*can also cause an infection of the skin when an open wound is exposed to warm seawater

Severe disease is rare and occurs more commonly in persons with weakened immune systems.

Illness is usually self-limiting and lasts 3 days.


200 *Vv*
100 deaths
80,000 *Vibrio* infections may occur annually in the United States
45,000 *Vp*
35,000 other *Vibrio* species

How do persons get infected with *V. vulnificus or V. parahaemolyticus?*

Raw or undercooked seafood consumption, particularly oysters

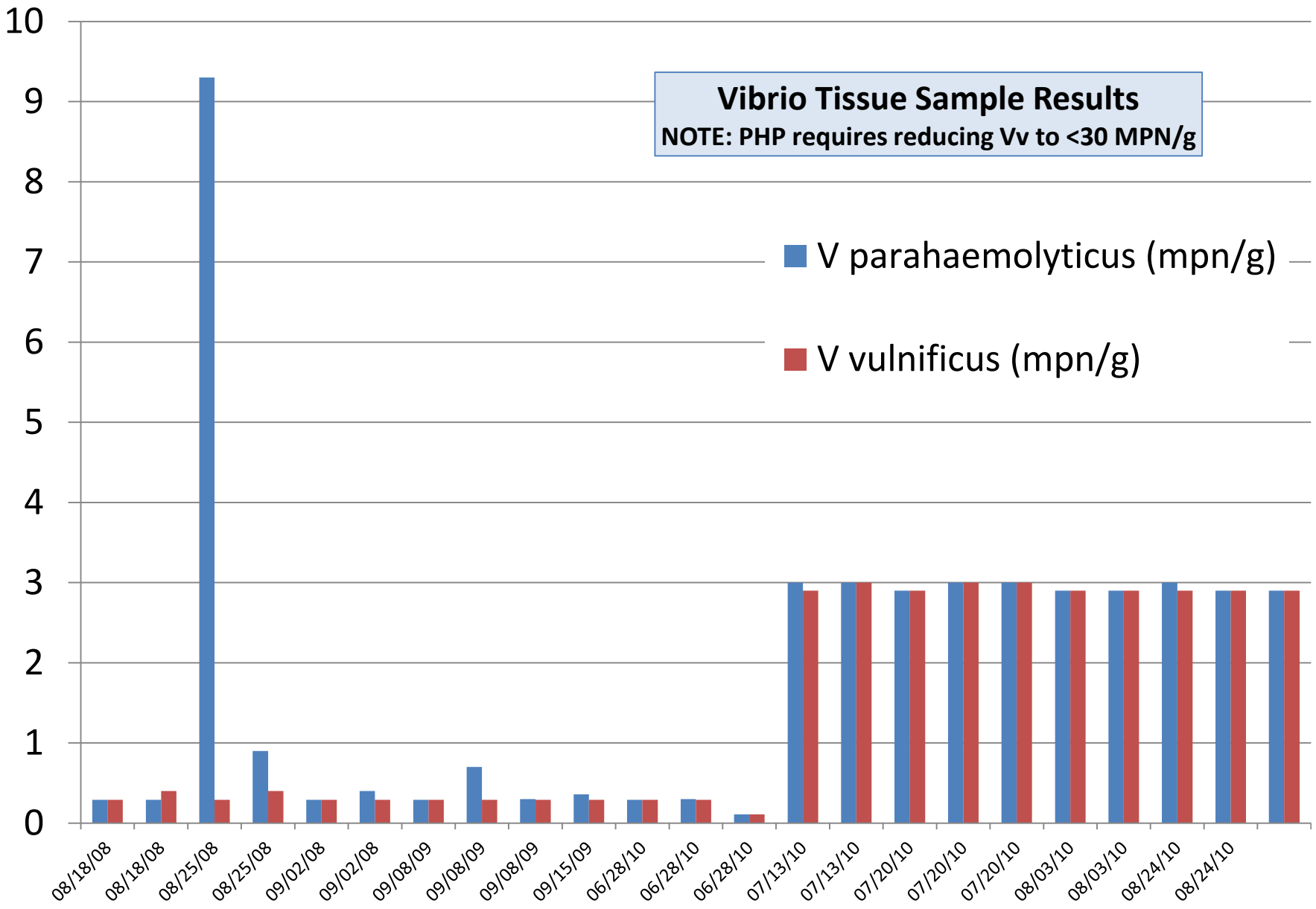
Most at risk for Vv are the immunocompromised, especially those with chronic liver disease (including hepatitis, cirrhosis and liver cancer) and also HIV/AIDS and cancer

A recent study showed that people with these pre-existing medical conditions were 80 times more likely to develop *V. vulnificus* bloodstream infections than were healthy people

Since it is naturally found in warm marine waters, people with open wounds can be exposed to *Vv and Vp* through direct contact with seawater

Vibrio Illness Investigations in CT

Year	Number of Cases	Source States
2009	7 (5 CT)	1 MA 1 CT or RI 1 CT or NY 1 Unknown 3 Definitely CT
2010	5 (3 CT)	1 ME, MD or VA 1 CT, ME, or WA 1 NY, WA, ME, MA 2 Definitely CT
2011	6 (5 CT)	1 CT, PE, NY 1 Unknown 3 Definitely CT 1 CT or WA


Vibrio Tissue Sample Results
NOTE: PHP requires reducing Vv to <30 MPN/g
V parahaemolyticus (mpn/g)
V vulnificus (mpn/g)
10
9
8
7
6
5
4
3
2
1
0
08/18/08
08/18/08
08/25/08
08/25/08
09/02/08
09/02/08
09/08/09
09/08/09
09/08/09
09/15/09
06/28/10
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06/28/10
07/13/10
07/13/10
07/20/10
07/20/10
07/20/10
08/03/10
08/03/10
08/24/10
08/24/10

Vp Bacteria Doubling Times

Temperature specific Vp Growth rates and Doubling times for calculating cumulative growth based on hourly temperature observations			
Oyster Temperature	Doubling Time	Oyster Temperature	Doubling Time
(degree F)	(hrs)	(degree F)	(hrs)
50	35.8		
55	13.8	80	1.64
60	7.24	85	1.28
65	4.45	90	1.03
70	3.01	95	0.85
75	2.17	100	0.71

Time to Temperature Model Ordinance
Harvester to Original Dealer

NEW REQUIREMENT: **Document time of first harvest and time to dock on harvest log and add this information to sales invoice** (many of you are doing this already)

From NSSP MO: The Authority shall ensure that harvesters document and provide *trip records* to the initial dealer demonstrating compliance with the time to temp requirements

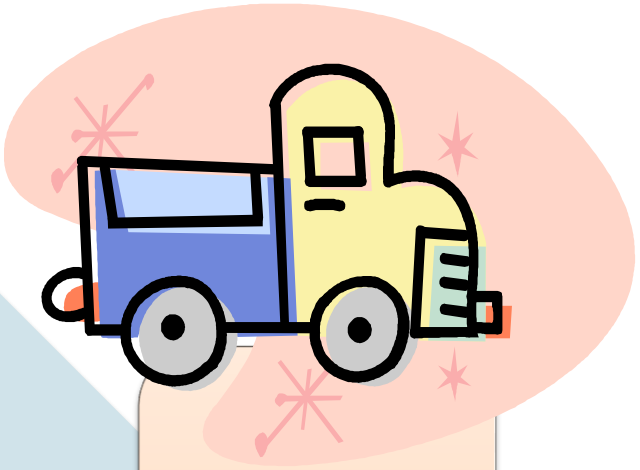
In CT trip records = harvest logs

Since according to CT statutes, harvest is limited to hours between sunrise and sunset, CT harvesters will have ***12 hours <u>total</u> from time of first Harvest to Refrigeration. Once docked, have up to 2 hours to refrigeration.***

NOTE: 12 Hour Requirement is only for months *OUTSIDE* of Vibrio Management months

(for CT likely to be July, August, September)

Harvester to Original Dealer



Temp inside the truck cannot exceed the outside air temp when the outside air temp is above 50 °F

Pick up with Cap, NO

Non-refrigerated Box Truck NO

Open pick up or flat bed truck OK

Refrigerated van running and cold at <=45 °F GREAT!

Product must be refrigerated within 2 hours of reaching dock and within 12 hours from time of first harvest

Original Dealer to Dealer 2

NEW Chapter XIII Shellstock Shipping

RECEIVING Critical Control Point

CRITICAL LIMIT 1

@01.A.(1)(c). Harvested the shellstock in accordance with the time temperature requirements of Chapter VIII .01 A. (1),(2), or (3) [C]

(1) Vv Control Plan (NOT YET in CT)

(3) 12 hours harvest to refrigeration in CT

(outside of Vibrio months)

This means that in order for the Dealer 2 to accept the product, Dealer 2 must know time the product was first harvested

(2) Vp Control Plan (NOT YET in CT)

Dealer to Dealer

NEW Chapter XIII Shellstock Shipping

RECEIVING Critical Control Point

CRITICAL LIMIT 2:

@01.A.(2) The dealer shall ship or repack only shellstock obtained and transported from dealer:

(a) Adequately iced, or (b) In a conveyance at or below 45°F ambient air temperature;

AND

(c) At an internal temperature of 50°F or less

Original Dealer to Dealer 2

NEW Chapter XIII Shellstock Shipping

RECEIVING Critical Control Point

CRITICAL LIMIT 3:

(3) Should a dealer receive shellstock from the original dealer which does not meet the requirements of A. 2. (a), (b), or (c) above, the shellstock shipment must be:

accompanied by time-temperature recording device indicating continuous cooling has occurred (for shipments of 4 hrs or less, device not required but time into refrigeration must be noted on invoice)

Original Dealer or Dealer 2+

NEW Chapter XIII Shellstock Shipping

SHELLSTOCK STORAGE Critical Control Point –

CRITICAL LIMIT 4:

@01. B. (4) All other shellstock obtained from a licensed harvester and intended for raw consumption shall be placed in a storage area or truck prechilled or maintained at 45˚F within 2 hours of receipt and cooled to an internal temperature of 50˚F within 10 Hours (of being placed into refrigeration) OR accompanied by a time-temperature recording device which indicates continuous temperature recording. Shipments of 4 hrs or less will not be required to have a time-temperature device.