Oysters and Seafood Safety

Vicki Pruente

Director of Research

Palacios Marine Agricultural Research, Inc.

Overview

- Introduction to Vibrio
- Managing Risk Before Harvest
- Managing Risk During Harvest
- Managing Risk After Harvest

Introduction to Vibrio

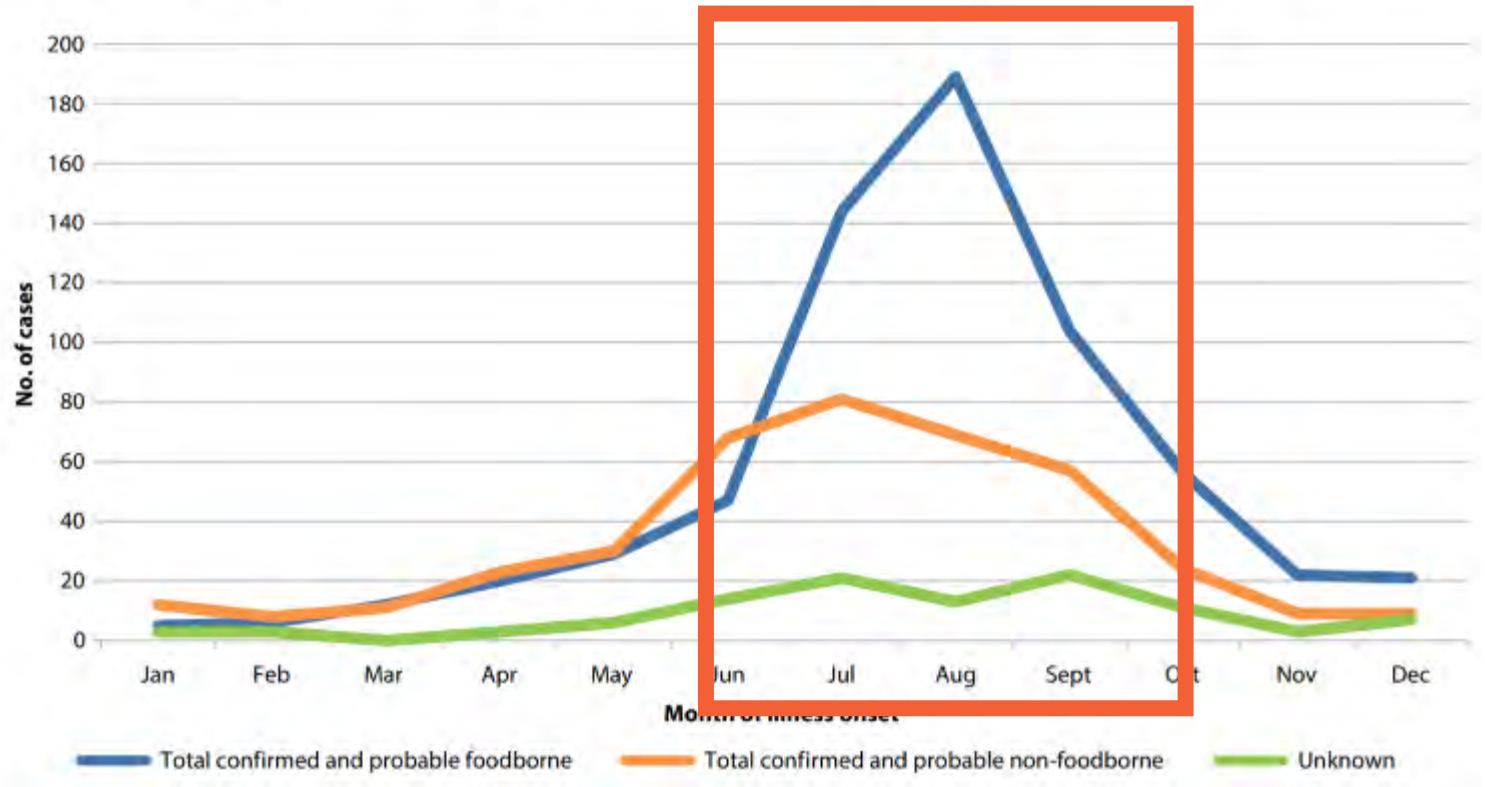
Vibrio Bacteria

Vibrio Bacteria

→ **Naturally found in brackish water**

- Not associated with pollution or contamination
- Highest levels occur during summer

Figure 3. Domestically acquired vibriosis cases, by month of illness onset or specimen collection (when onset date not available), and transmission route, United States, 2014 (N=1,162*).



Vibrio Bacteria

→ **Naturally found in brackish water**

- Not associated with pollution or contamination
- Highest levels occur during summer

→ ***Vibrio vulnificus (Vv)***

- Affects immunocompromised people
- Gastroenteritis, primary septicemia
- Accounts for 95% of seafood-related deaths

Vibrio Bacteria

→ **Naturally found in brackish water**

- Not associated with pollution
- Highest levels occur during summer months

→ ***Vibrio vulnificus (Vv)***

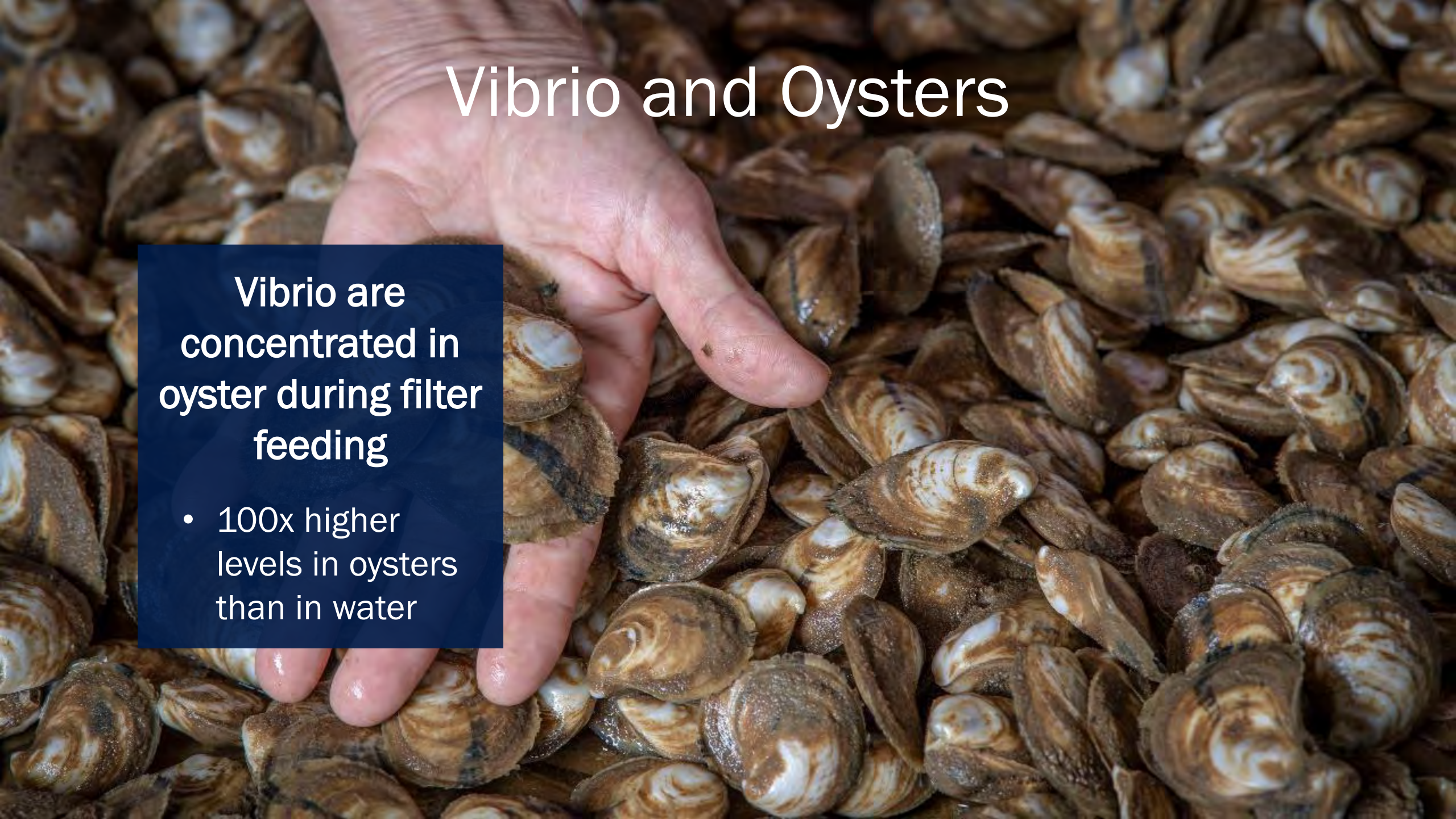
- Affects immunocompromised people
- Gastroenteritis, primary septicemia
- Accounts for 95% of seafood-related deaths

→ ***Vibrio parahaemolyticus (Vp)***

- Can affect anybody
- Gastroenteritis, septicemia
- Leading cause of seafood-related infection

Vibrio and Oysters

Vibrio and Oysters



Vibrio are concentrated in oyster during filter feeding

- 100x higher levels in oysters than in water

Vibrio and Oysters

Vibrio are concentrated in oyster during filter feeding

- 100x higher levels in oysters than in water

No way to prevent this!

Vibrio and Oysters

Vibrio are concentrated in oyster during filter feeding

- 100x higher levels in oysters than in water

No way to prevent this!

There is risk. How do you manage it?

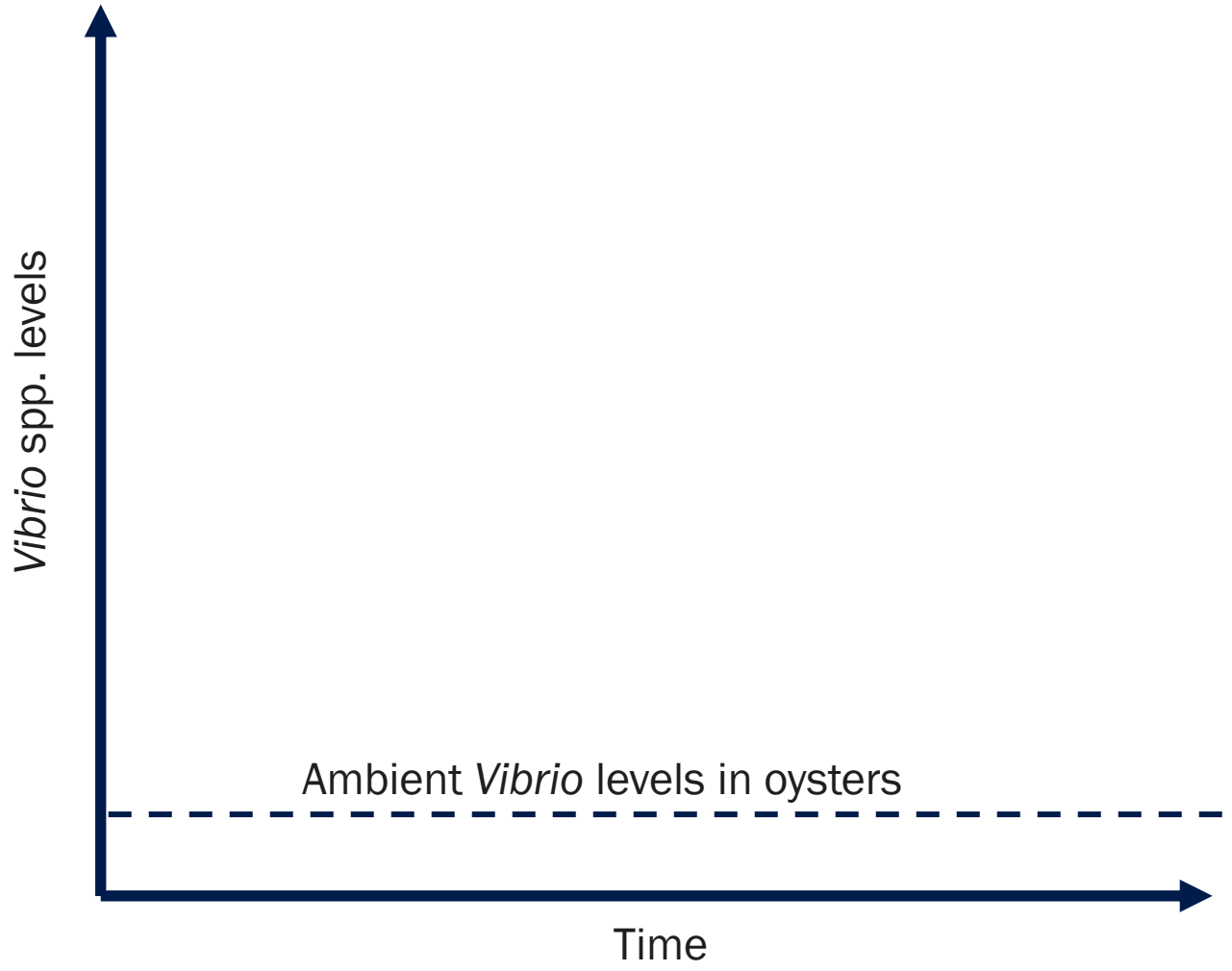
- Pre-harvest
- During harvest
- Post-harvest

Managing Risk Before Harvest

Routine Handling and *Vibrio* Risk

Routine Handling

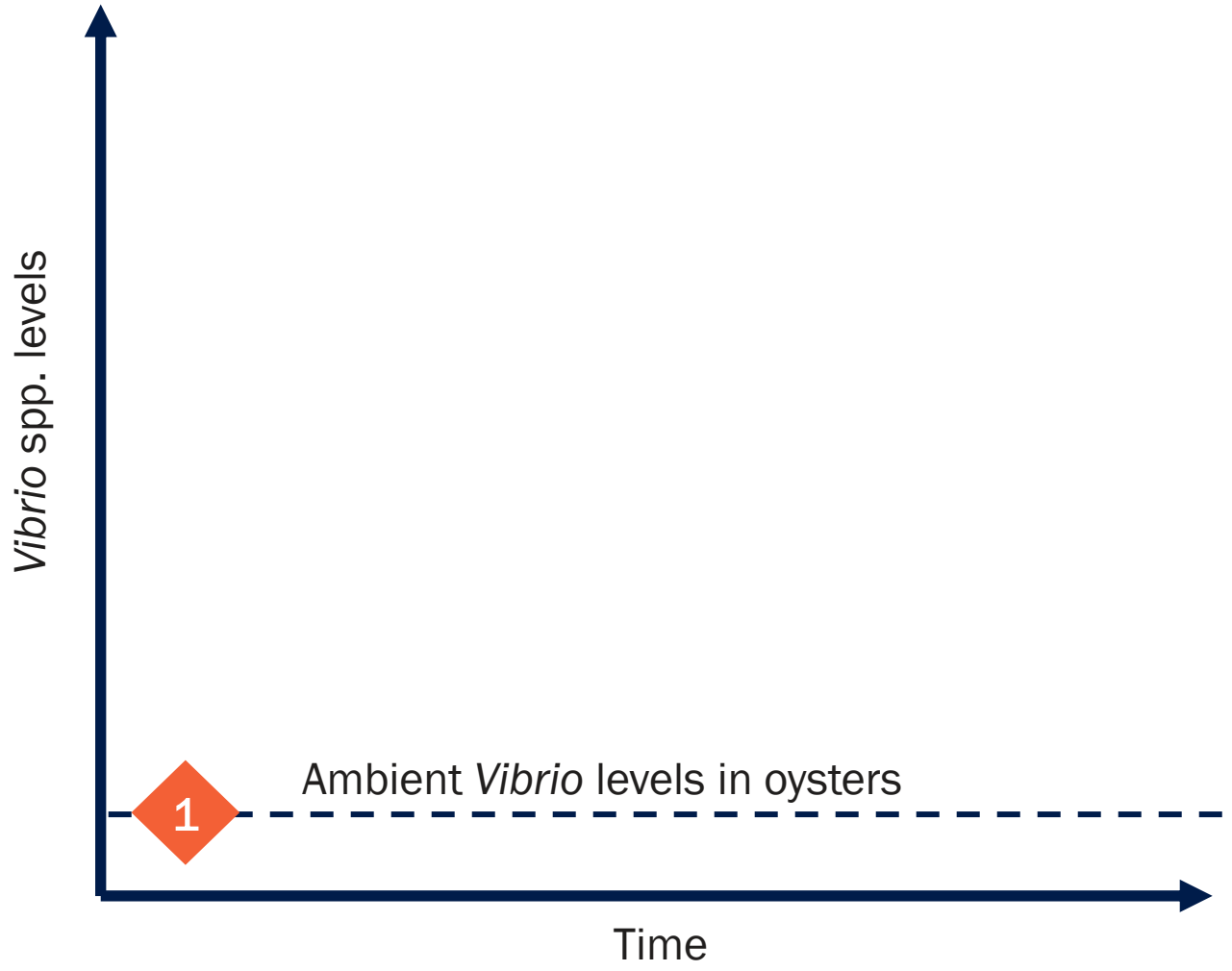
- Tumbling
- Desiccation
- Sorting and culling



Routine Handling and *Vibrio* Risk

1 Pre-Handling

- Ambient *Vibrio* levels in oysters



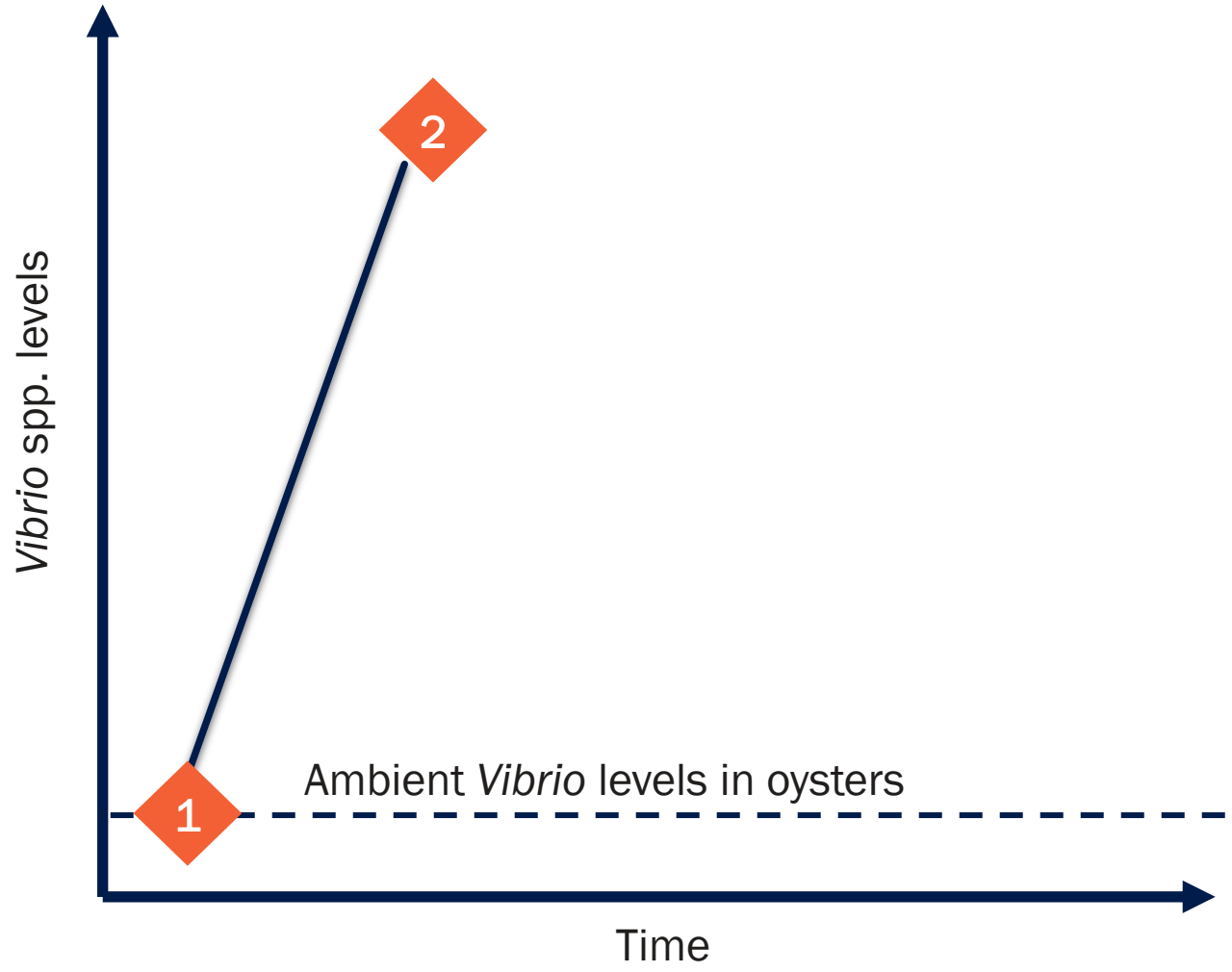
Routine Handling and *Vibrio* Risk

1 Pre-Handling

- Ambient *Vibrio* levels in oysters

2 Routine Handling

- *Vibrio* levels increase



Routine Handling and *Vibrio* Risk

1 Pre-Handling

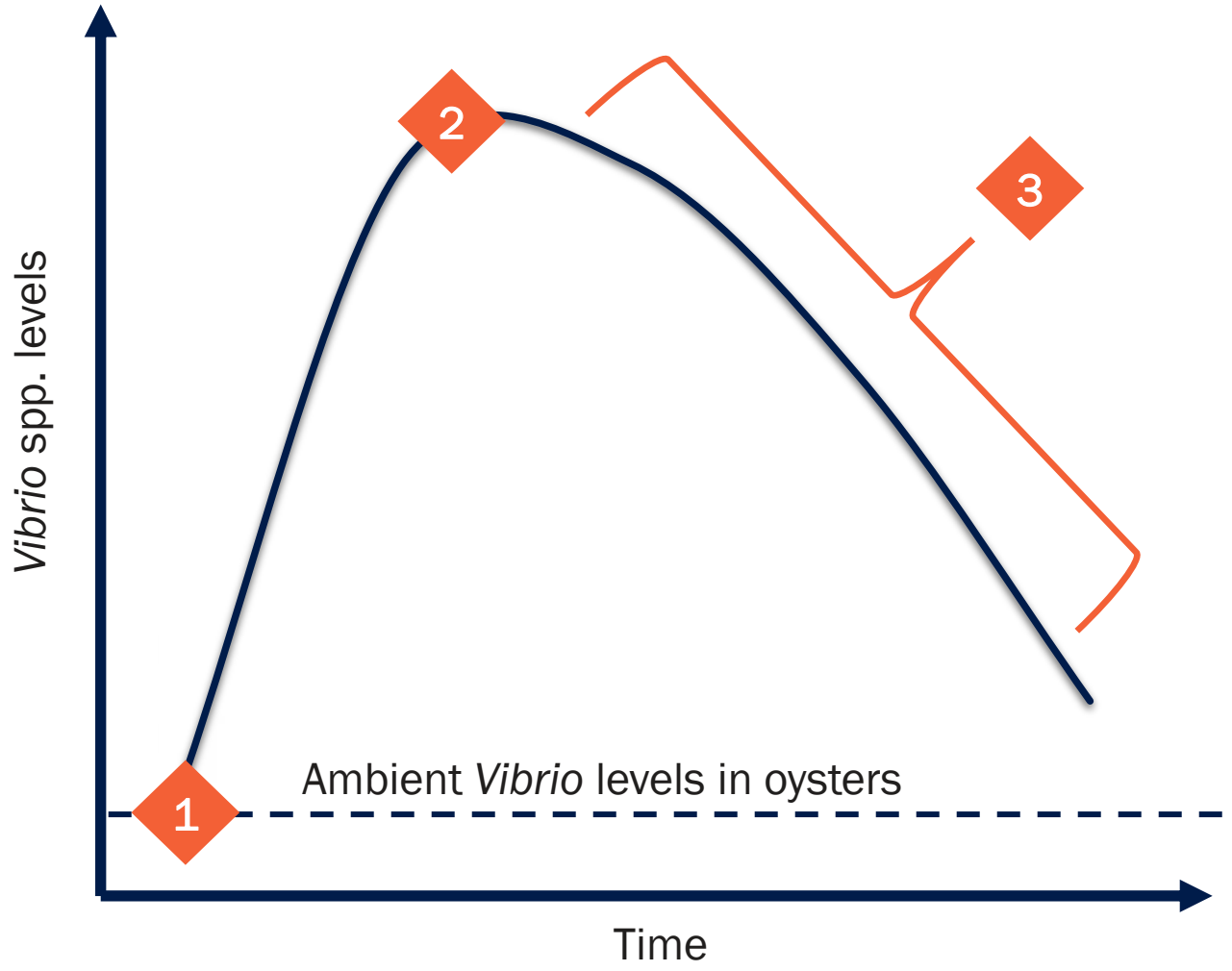
- Ambient *Vibrio* levels in oysters

2 Routine Handling

- *Vibrio* levels increase

3 Resubmersion Period

- Elevated *Vibrio* levels decrease
- 7-14 days, depending on state, gear type, handling method



Routine Handling and *Vibrio* Risk

1 Pre-Handling

- Ambient *Vibrio* levels in oysters

2 Routine Handling

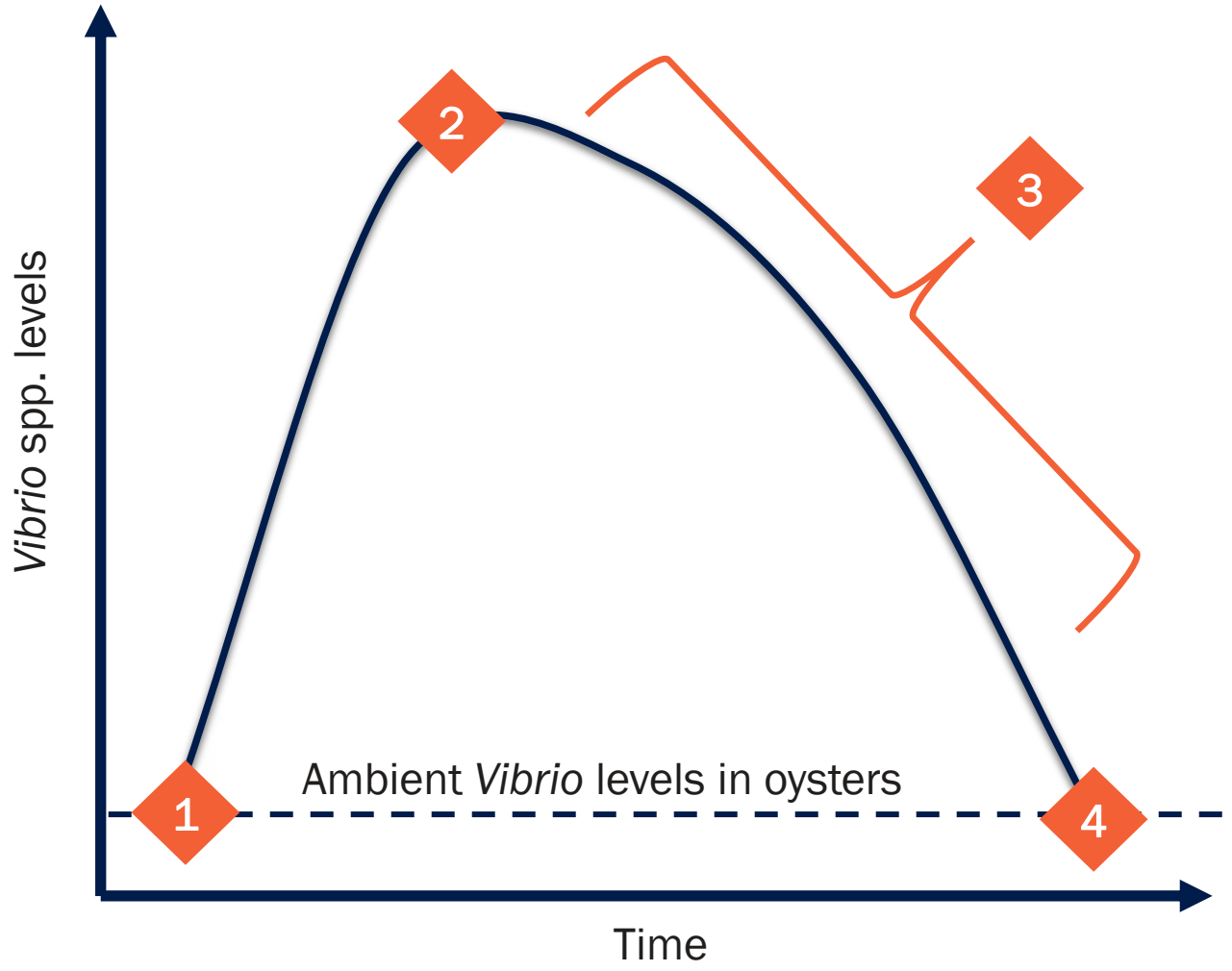
- *Vibrio* levels increase

3 Resubmersion Period

- Elevated *Vibrio* levels decrease
- 7-14 days, depending on state, gear type, handling method

4 Harvest

- *Vibrio* levels recovered to ambient levels



Best Pre-Harvest Practices

What might interrupt feeding?

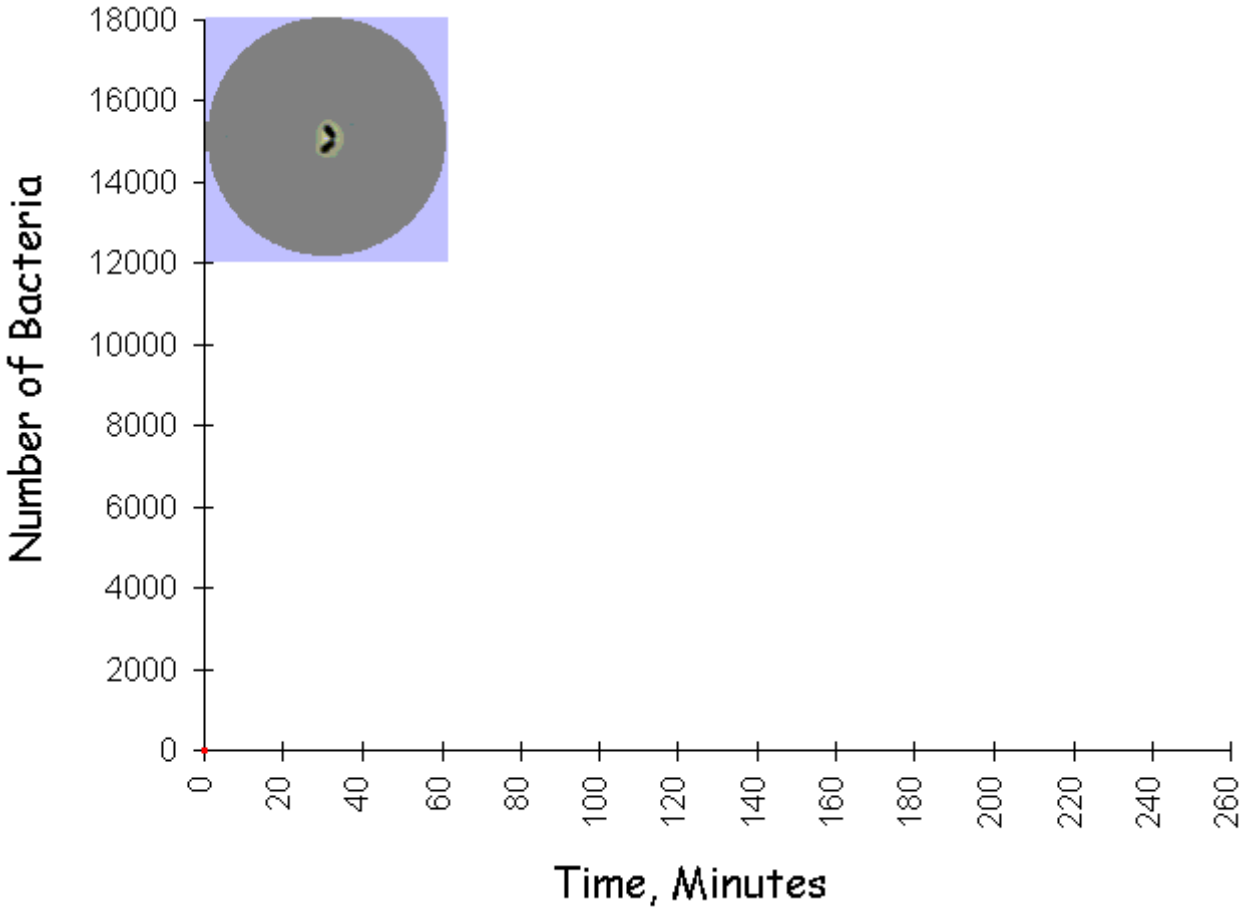
- Rough handling
- Heavy wind/waves
- Overcrowded, fouled bags

Best practice: only harvest oysters that you have every reason to believe were filtering/feeding normally

Managing Risk During Harvest

Prepare oysters ahead of time

- Pre-count oysters into bags to fill orders
- Observe resubmersion period
- Efficient harvest



During harvest: every minute counts

- 90°F – vibrio population doubles every hour
- 80°F – vibrio population doubles every two hours

APPENDIX "A"

Time limits for harvest and refrigeration of shellfish to be sold to the final consumer as shellstock or for half-shell service.

Shellfish harvested for approved post-harvest processing to control Vibrio bacteria, or for sale to a permitted shellfish processing facility for the purpose of shucking, **and with tags attached to the harvest container (bag, sack, or box) stating such restricted use**, shall be exempted from the time controls stated in Column 3.

Column 1 MONTH	Column 2 DAILY MAXIMUM WATER TEMPERATURE	Column 3 MAXIMUM TIME ALLOWED ON HARVEST REEF FOR ONE TRIP	Column 4 MAXIMUM TIME ALLOWED FROM LANDING TO DELIVERY TO PERMITTED PROCESSOR	Column 5 *MAXIMUM TIME TO COOL OYSTERS TO °F, from time of receiving
JANUARY	56°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°
FEBRUARY	57°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°
MARCH	63°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°
APRIL	70°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°
MAY	78°F	5 hours	1.5 hours	6 hours to 55°
JUNE	85°F	4 hours	1.5 hours	6 hours to 55°
JULY	86°F	4 hours	1.5 hours	6 hours to 55°
AUGUST	86°F	4 hours	1.5 hours	6 hours to 55°
SEPTEMBER	83°F	4 hours	1.5 hours	6 hours to 55°
OCTOBER	74°F	5 hours	1.5 hours	6 hours to 55°
NOVEMBER	66°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°
DECEMBER	56°F	Set by ADCNR – MRD**	1.5 hours	6 hours to 55°

*Maximum time allowed on harvest reef for one trip" based on National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish, 2009 Revision, Section II, Chapter II, Parts .04 and .05, and allows one hour 30 minutes for transport time from harvest area landing to approved refrigeration. This delivery time is noted in "Maximum time allowed from landing to delivery to permitted processor".

Get them cold and keep them cold

- Above 40-50°F, vibrios continue to grow
- Anytime you can beat the maximum time to temperature window, you are decreasing the risk to the consumer!

Managing Risk After Harvest

Educate Your Buyers

- Temperature abuse can happen anywhere along the cold chain
  - Shipping
  - At restaurant
  - Direct sales to customers
- Make sure customers know to keep them cold all the way up to eating the oysters!

Questions?

Email me at vpruente@pmartexas.org