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TASMANIA 



Vibrio parahaemolyticus – should we be worried and what can we do?

**Alison Turnbull, Institute of Marine and Antarctic Studies
NSW Oyster Growers Conference**

18th June 2022

A collection of traditional Aboriginal Tasmanian objects is displayed on a light-colored, textured surface. In the foreground, there is a small, dark, woven bag with a purple and white beaded border. To its right is a large, shallow, reddish-brown bowl, likely made of ochre. In the background, two larger woven baskets are visible, one containing dark stones and another containing white shells. The objects are arranged in a way that suggests their use in traditional practices.

Acknowledgement of country

In the spirit of reconciliation, the University of Tasmania respectfully acknowledges the Yuin nation. The University also recognises the Aboriginal history and culture of the land and acknowledges and pays respect to the Traditional Owners and to Elders past, present and emerging.

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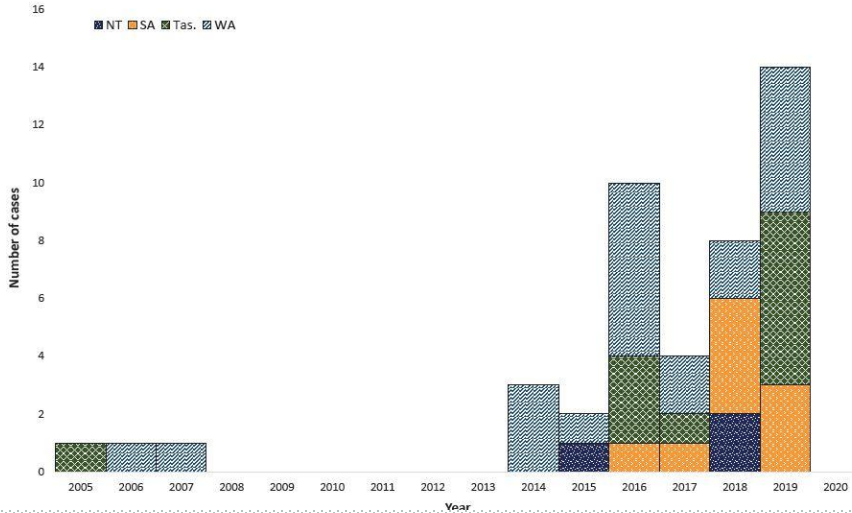


We have known about Vibrio in Australia shellfish for many years....

1. FRDC 1980-035 Depuration study NSW DPI (Fishing Industry Research Trust Account)
2. FRDC 1982-008 Method development for Vp and Vv CSIRO
3. FRDC 1991-074 Depuration Vv from SRO UNSW
4. FRDC 2002-409 Pathogenic Vp in Aus oysters UTAS
5. FRDC 2005-041 Supply chain assessment of Vibrios UoA
6. FRDC 2007-719 Predicting Vibrio growth in the supply chain UTAS
7. SCRC 2008-730 Codex working group on Vibrio SARDI
8. FRDC 2015-042 Pathogenic vibrio from St Helens SARDI
9. **FRDC 2018-031 Pathogenic vibrio from Tasmania SARDI**
10. **FRDC 2020-043 Toxigenic vibrio in TRO CDU**

Vibrio in seafood causes an estimated 52,000 illnesses per year in USA

Figure 1: Locally-acquired foodborne cases of *V. parahaemolyticus*, in jurisdictions^a where *Vibrio* infection/*V. parahaemolyticus* is notifiable, by derived diagnosis year,^b 2005-2020



But we haven't had a problem until recently

- *Vibrio* illnesses associated with shellfish were rarely reported prior to 2012. Reported cases were not attributable to a source
- Not a notifiable disease in Qld, NSW and Vic
- Attribution to source has improved since 2016 – illnesses have been reported in association with oysters from all major producing states
- 41 cases were reported between 2005 and 2020 from states where reporting is mandatory
- 290 cases reported in association with SA oysters in 2021/2022 during two outbreaks

Table 1: Outbreaks of non-cholera vibriosis recorded in Australia with number of cases and total cases where *Vibrio* species were confirmed from clinical specimens, 2002–2019^a

Year	Jurisdiction reporting outbreak ^b	Cases (number confirmed)	<i>Vibrio</i> species	Suspected vehicle	Source jurisdiction ^a
2002	NSW	2 (1)	<i>V. parahaemolyticus</i>	Unknown	Unknown
2005	Tas.	2 (1)	<i>V. parahaemolyticus</i>	Unknown	Unknown
2016	Tas. ^c	11 (8)	<i>V. parahaemolyticus</i>	Oysters	Tas.
2016	WA ^d	9 (9)	<i>V. parahaemolyticus</i>	Oysters	SA
2017	NSW	3 (1)	<i>V. albensis</i>	Oysters	Tas.

Vibrio illnesses associated with the 2021 SA outbreaks

- 21 cases Feb-March 2021 associated with SA oysters
- >269 cases Sept '21 - Dec '22 associated with SA oysters, majority from Coffin Bay
- Unusual event - started at just below 15°C water temp (winter-spring)
- Research project proposed to investigate environment factors that may have contributed



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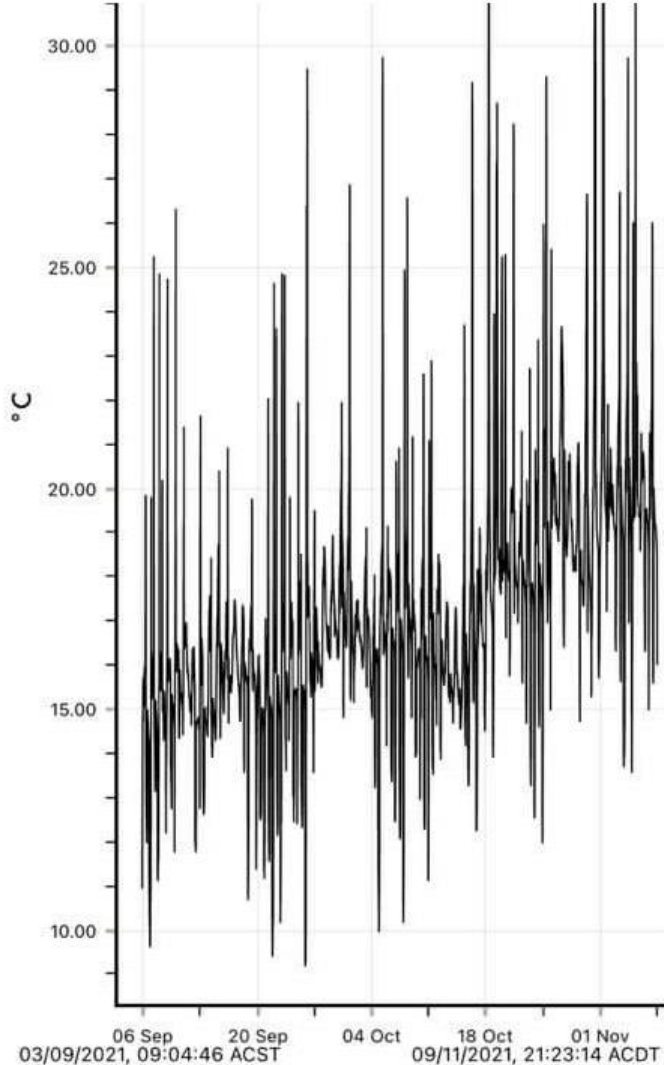
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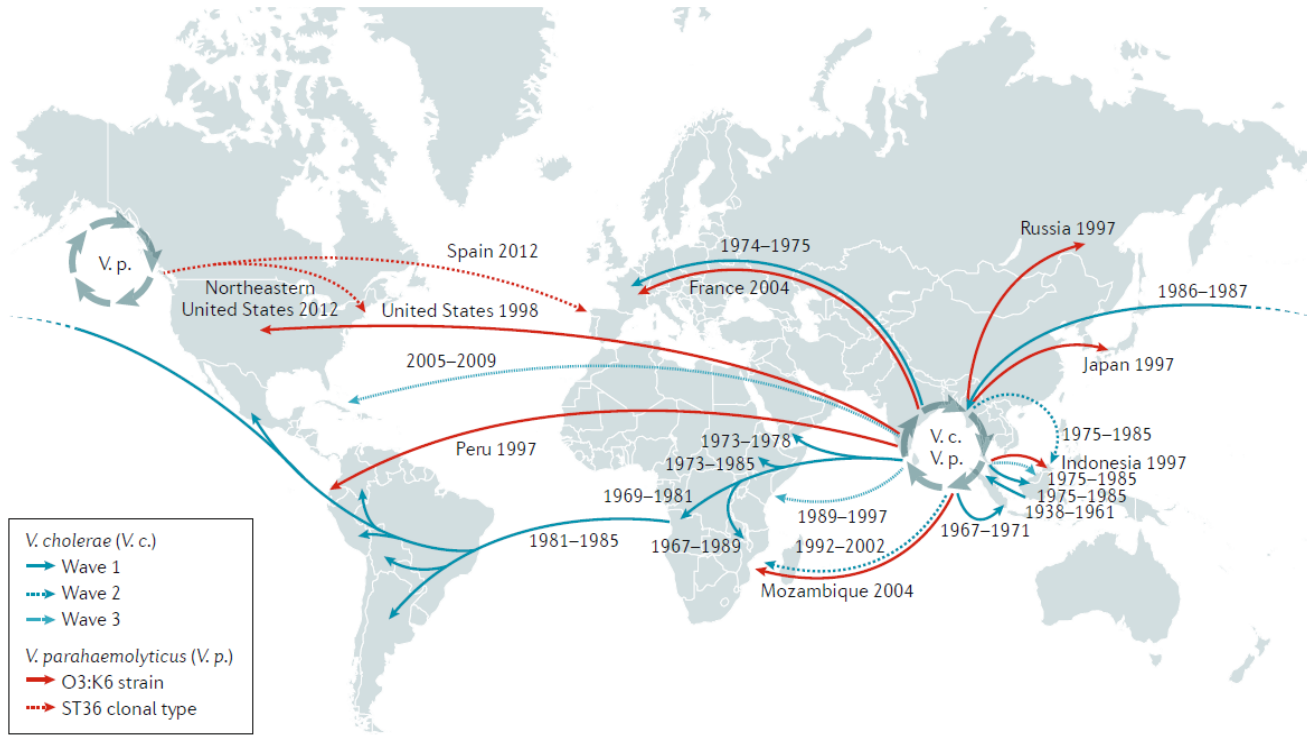
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Tracking the source and spread of the new pandemic *V. parahaemolyticus*



- Outbreaks are undergoing a global process of expansion
- Emerging in areas where these diseases have not been previously observed – particularly in cold water climates
- ST36 pandemic strain emerged in NE USA in 2012
- SA 2021 outbreaks
 - Feb/March ST36
 - Sept-Jan ST50 & ST 417

Source: Baker-Austin et al. (2018)

3 Cases: Raw oysters, commercially available,
1: Harvested from Lower Walkare on 05/11/2021
2: Harvested from Upper Walkare on 12/11/2021
3: Harvested from Upper Walkare on either 07/01/2022 or 09/01/2022

2 Cases: Raw, oysters, recreationally gathered, Kaipara region, on
1: Unknown/TBC
2: on 28/11/2021

1 Case: Raw oysters, commercially available, harvested from South Kaipara on 29/11/2021

1 Case: Raw, oysters, recreationally gathered, unknown location on 06/02/2022

1 Case: Raw, oysters, recreationally gathered, Omokoti Bay, Southhead, Kaipara

1 Case: Raw, oysters, recreationally gathered, Clark's Beach, Auckland

1 Case: Raw, mussels, recreationally gathered, Karorihi beach, Waiuku

1 Case: Raw, oysters, recreationally gathered, Moetape Bay in Mahau Sound in Marlborough Sounds, on 02/01/2022

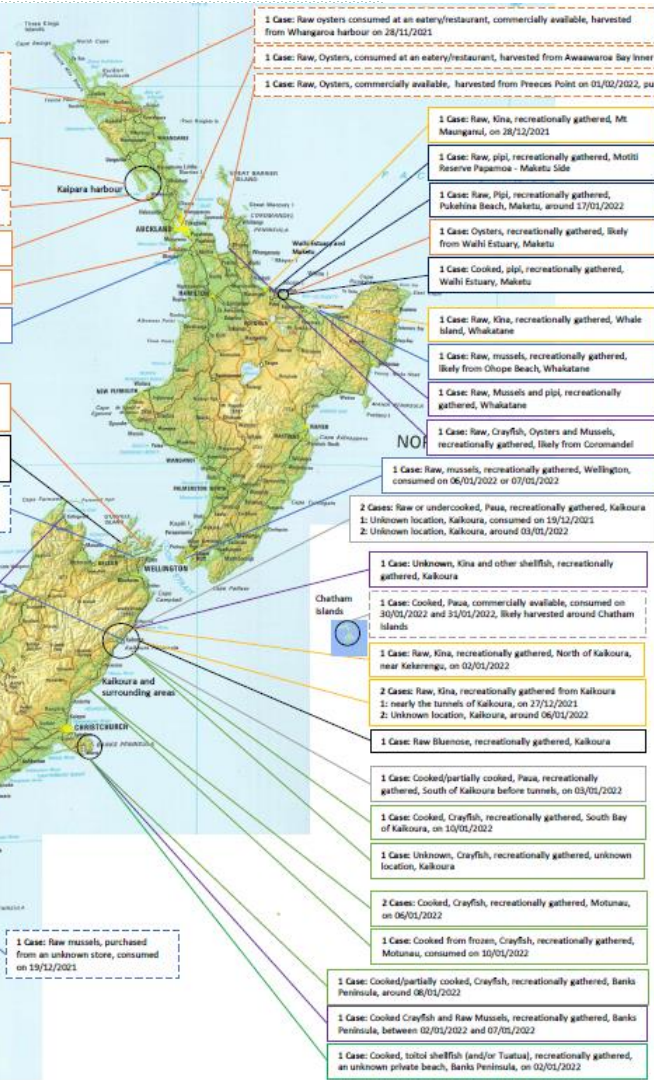
1 Case: Cooked Cod and Snapper and Raw Warehouse, recreationally gathered, Okoi Bay (near campground) in Marlborough Sounds, on 01/01/2022

1 Case: Raw/partially cooked mussels, commercially available, harvested from Eastern Pelorus Sound on 13/10/2021

1 Case: Cooked, mussels from an eatery/restaurant, Kalkoura, mussels supplied by a commercial supplier. Harvest information unavailable.

1 Case: Raw, mussels, recreationally gathered, Cape Foulned, Westport, on 01/02/2022

1 Case: Raw, mussels, commercially available, harvested from Collingwood on 16/01/2022
Unknown, Kahawai, recreationally gathered, Houkika River



1 Case: Raw oysters consumed at an eatery/restaurant, commercially available, harvested from Whangara harbour on 28/11/2021

1 Case: Raw, Oysters, consumed at an eatery/restaurant, harvested from Awaarao Bay Inner on 08/12/2021

1 Case: Raw, Oysters, commercially available, harvested from Preece Point on 01/02/2022, purchased on 11/02/2022

1 Case: Raw, Kina, recreationally gathered, Mt Maungani, on 28/12/2021

1 Case: Raw, pipi, recreationally gathered, Motiti Reserve Papamoa - Maketu Side

1 Case: Raw, Pipi, recreationally gathered, Pukekaha Beach, Maketu, around 17/01/2022

1 Case: Oysters, recreationally gathered, likely from Waihi Estuary, Maketu

1 Case: Cooked, pipi, recreationally gathered, Waihi Estuary, Maketu

1 Case: Raw, Kina, recreationally gathered, Whale Island, Whakatane

1 Case: Raw, mussels, recreationally gathered, likely from Ohope Beach, Whakatane

1 Case: Raw, Mussels and pipi, recreationally gathered, Whakatane

1 Case: Raw, Crayfish, Oysters and Mussels, recreationally gathered, likely from Coromandel

1 Case: Raw, mussels, recreationally gathered, Wellington, consumed on 06/01/2022 or 07/01/2022

2 Cases: Raw or undercooked, Paua, recreationally gathered, Kalkoura
1: Unknown location, Kalkoura, consumed on 19/12/2021
2: Unknown location, Kalkoura, around 03/01/2022

1 Case: Unknown, Kina and other shellfish, recreationally gathered, Kalkoura

1 Case: Cooked, Paua, commercially available, consumed on 30/01/2022 and 31/01/2022, likely harvested around Chatham Islands

1 Case: Raw, Kina, recreationally gathered, North of Kalkoura, near Kakerangi, on 02/01/2022

2 Cases: Raw, Kina, recreationally gathered from Kalkoura
1: nearly the tunnels of Kalkoura, on 27/12/2021
2: Unknown location, Kalkoura, around 06/01/2022

1 Case: Raw Bluenose, recreationally gathered, Kalkoura

1 Case: Cooked/partially cooked, Paua, recreationally gathered, South of Kalkoura before tunnels, on 03/01/2022

1 Case: Cooked, Crayfish, recreationally gathered, South Bay of Kalkoura, on 10/01/2022

1 Case: Unknown, Crayfish, recreationally gathered, unknown location, Kalkoura

2 Cases: Cooked, Crayfish, recreationally gathered, Motunua, on 06/01/2022

1 Case: Cooked from frozen, Crayfish, recreationally gathered, Motunua, consumed on 10/01/2022

1 Case: Cooked/partially cooked, Crayfish, recreationally gathered, Banks Peninsula, around 08/01/2022

1 Case: Cooked, totiti shellfish (and/or Tuatua), recreationally gathered, Banks Peninsula, between 02/01/2022 and 07/01/2022

1 Case: Cooked, totiti shellfish (and/or Tuatua), recreationally gathered, an unknown private beach, Banks Peninsula, on 02/01/2022

1 Case: Unknown, Paua and Kina, TBC gathering, South Island

Pending information about source of shellfish or fish for plotting – 2 confirmed cases.

Sourced from Topographic Map New Zealand 1:4 million. Crown Copyright Reserved

Glossary

- Per location of harvest (if known, otherwise location of consumption/purchase)
- Preparation method, seafood type, location of harvest, date (if known)
- Legend**
- Solid outline = recreational
- Dotted outline = commercial
- Colour coding for the outline per source of seafood:

- Crayfish
- Fish
- Kina
- Mussels
- Oysters
- Pipi
- Paua
- Totiti/Tuatua shellfish
- Multiple sources of seafood consumed.

Should we be worried?

Yes, absolutely

What can we do?.....

Challenges faced by Australia

New issue

Federal system

- Notifiable disease status
- Reporting between states

Reporting agreements between government departments

Lack of vibrio specific policy at ASQAAC

- When to close
- How to open
- Post-harvest treatment options

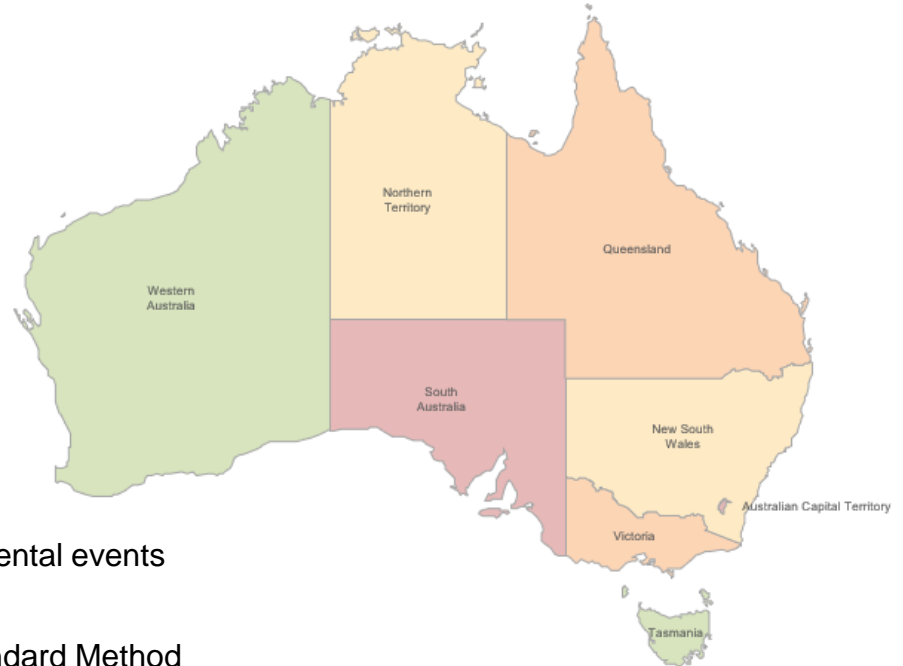
Low levels of contamination, sporadic illness

No history relating outbreaks/elevated numbers to environmental events

Lab capability & capacity

- Different methods in use, proposed changed to Aus Standard Method
- Sensitivity issues

Traceability issues in a complex supply chain



Knowledge gaps

- Levels pathogen associated with illness
 - Analytical sensitivity
 - Variability of serotypes (pathogenicity & virulence)
- What are pathogenicity markers?
- Relationships between environmental and clinical isolates
- Importance of gene translation
- Prevalence in oysters, environmental reservoirs
- Relationships with environmental factors
- ***How to manage risk in the absence of a measurable pathogen?***



VIBRIO PARAHAEMOLYTICUS

A Guide for Tasmanian Shellfish Growers



What can growers do right now?

Vp Growers guide

- Cease harvesting
- Relaying to colder/saltier waters
- Harvest curfews
- Re-submerge
- Time to cool chain
- Packing practices

What can regulators do right now?

Vibrio Control Plans

- Required in SA and Tas in all areas that have been associated with illness
- Strict temperature control
- Strict record keeping or time of harvest, time to cool room, time of dispatch

Nov 1 st – April 30 th	Air temp >30 °C	Water temp >19 °C	Selling to public?
<12 hours to cool chain	<7 hrs to cool chain	<7 hrs to cool chain	Oysters <10 °C



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Thank you

SafeFish/ASQAAC vibrio science day 15th June

Register at www.SafeFish.com.au next week





NSW SHELLFISH PROGRAM

SURVEY PLAN – VIBRIO PARAHAEMOLYTICUS IN NSW OYSTERS 2022-2024

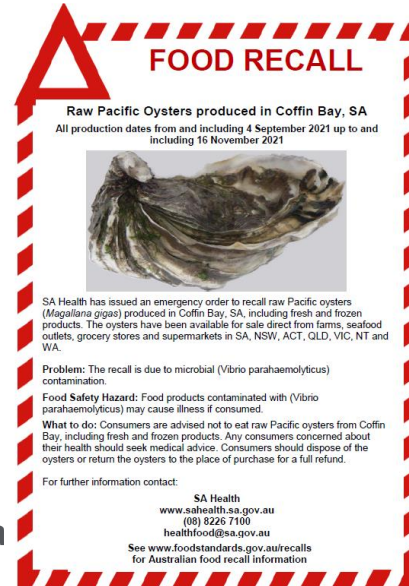
NSW Oyster Conference
18 June 2022



Anthony Zammit – Manager NSW Shellfish Program


NEED FOR A VIBRIO PARHAEMOLYTICUS SURVEY

- Risk appears to be increasing globally.
- Recent increase in cases from Australian shellfish.
- Lack of data on levels and strains of *Vibrio parahaemolyticus* in NSW waters.
- NSW industry is expanding into new species.
 - Does this increase the risk of an outbreak?
 - Are tighter controls needed for new species such as pacific oysters?
- **Provide baseline data to assist in re-opening an area if an outbreak occurs.**



FOOD RECALL

Raw Pacific Oysters produced in Coffin Bay, SA
All production dates from and including 4 September 2021 up to and including 16 November 2021



SA Health has issued an emergency order to recall raw Pacific oysters (*Magallana gigas*) produced in Coffin Bay, SA, including fresh and frozen products. The oysters have been available for sale direct from farms, seafood outlets, grocery stores and supermarkets in SA, NSW, ACT, QLD, VIC, NT and WA.

Problem: The recall is due to microbial (*Vibrio parahaemolyticus*) contamination.

Food Safety Hazard: Food products contaminated with (*Vibrio parahaemolyticus*) may cause illness if consumed.

What to do: Consumers are advised not to eat raw Pacific oysters from Coffin Bay, including fresh and frozen products. Any consumers concerned about their health should seek medical advice. Consumers should dispose of the oysters or return the oysters to the place of purchase for a full refund.

For further information contact:

SA Health
www.sahealth.sa.gov.au
(08) 8226 7100
healthfood@sa.gov.au

See www.foodstandards.gov.au/recalls for Australian food recall information

RESPONSE TO AN ILLNESS OUTBREAK

- ASQAP Manual Section 9 – Investigation of Illness Associated with Shellfish
 - When two or more cases from the same harvest area must close the harvest area.
 - It must stay closed until the problem is identified and the risk removed or managed.
 - Key questions:
 - What has occurred?
 - Why did it happen?
 - How can it be prevented in the future?
- The survey will provide baseline data. This will assist in understanding if the environment (i.e. the Vp prevalence or strains present) has changed.

AUSTRALIAN SHELLFISH
QUALITY ASSURANCE
PROGRAM

Operations Manual

Version 5

2019



Food
Authority

NSW SURVEY PLAN

- Survey to commence in March/April 2022 and run for 2 years.
- Test for presence and level of Vp.
- Analyse positive samples for virulence markers (tdh/trh markers).
- Estuaries chosen based on location, species and production.

Estuary/Harvest Area	Target Species	Number of Samples per Month
Manning River – Pelican Point	Sydney Rock Oysters	5
Wallis Lake – Long Island	Sydney Rock Oysters	5
Port Stephens – Lemon Tree Passage/Cromarty Bay	Sydney Rock Oyster and Pacific Oysters.	10
Clyde River - Rocky Point	Sydney Rock Oyster or Pacific Oyster.	5
Merimbula Lake – Top Lake	Sydney Rock Oyster	5
<i>Samples per Month</i>		<i>30</i>
Total Samples over 2 years		720

RESPONSE TO RESULTS

Result (cfu or MPN/g)	Interpretation	Action
<3	Satisfactory	No action required
<3-100	Marginal	Review survey results to determine if further investigation is required.
101-10,000	Unsatisfactory .	Further analysis of isolates to determine the level of pathogenic <i>V.parahaemolyticus</i> .
>10,000	Potentially hazardous	<p>Further analysis of isolates to determine the level of pathogenic <i>V.parahaemolyticus</i>.</p> <p>Review environmental factors (temperature/salinity).</p> <p>Additional testing of harvested product to determine whether the elevated Vp levels are transient or endemic in nature.</p> <p>Consider whether current time and temperature controls are adequate to manage the risk considering the species in the harvest area.</p> <p>Additional testing of product along the supply chain to verify time/temperature protocols.</p>



THANK YOU

QUESTIONS?

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