Understanding *Vibrio parahaemolyticus*

Vp may cause gastroenteritis in humans and is associated with the consumption of raw, improperly cooked, or cooked and re-contaminated fish and/or shellfish.[6] The incubation period ranges from 8 to 72 hours and the onset of disease is very sudden with explosive diarrhoea. Other symptoms include nausea, vomiting, headache, fever and chills. Symptoms typically subside within 48 to 72 hours but may last up to a week and treatment of most cases primarily includes rehydration.[1]

Biology of *Vp*

Being a mesophilic, salt tolerant bacteria, *Vp* will grow well in seafood stored at ambient temperature.[1] Growth at the optimum temperature, 37°C, can be very rapid and doubling times of 9-10 minutes have been reported.[2]

Rapid and efficient cooling (time and temperature control); is one of the most important control parameters in prevention of *V. parahaemolyticus* gastroenteritis. Cooling to 5°C will prevent growth.[1]

Vp occurs in estuaries throughout the world and is easily isolated from coastal waters as well as from sediment, suspended particles, plankton, but not in the open sea. *Vp* has an annual cycle; the bacteria survive in the sediment during the winter and are released into the water associated with the zooplankton when the water temperature rises.[7]

Vp is commonly isolated from bivalve molluscs. Levels fluctuate with temperature with the higher numbers being isolated in the warmer months.[1] *Vp* is rarely isolated when water temperatures are <l5°C.[2]

Water temperatures on intertidal leases during the summer months may remain in the range favourable to *Vp* growth. Oysters from deep-water leases, which remain totally submerged, have also demonstrated *Vp* levels that greatly exceed 100 MPN/g, likely due to *Vp* growth in the marine environment.

The study by Nordstrom et al [5], demonstrates that *Vp* levels in live oysters are at a peak at the end of the low tide cycle after the oysters are out of the water and are exposed to warm air and the sun. The study also demonstrates that *Vp* levels in the oysters seem to return to the *Vp* level before they were exposed to the low tide cycle. Similar results were found by Buenaventura, Schallié, et al [9] and Herwig and Cheney.[10]

The USFDA Risk Assessment[0] document provides references to support that depuration, using UV treatment, has little effect on *Vp* levels in naturally infected oysters or clams. The European Commission's Scientific Opinion[7] document comes to a similar conclusion.

While these last two paragraphs seem contradictory, it is possible that in the Nordstrom study, the new growth, which results from the rise in *Vp* level after exposure during the low tide cycle, is more readily purged so that *Vp* levels return to those levels more indicative of the background level of *Vp* in the growing waters. And is possible that the USFDA references are indicating that UV treated systems will not readily remove background *Vp* levels that are already entrenched in the oyster.

In any case, validation data is necessary to support that any system (depuration, relaying, wet holding) is capable of consistently reducing *Vp* levels to an acceptable level.

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