

Abstract

Postharvest multiplication of *Vibrio parahaemolyticus* and *Vibrio vulnificus* in molluscan shellfish may increase human health risks. Growth and survival of *V. parahaemolyticus* and *V. vulnificus* were determined in postharvest oysters stored at 26°C for 0, 5, 10, and 24 h. Following 24 h at 26°C, oysters were transferred to 3°C and analyzed 14 to 17 d later. *V. parahaemolyticus* densities were determined by three methods: (1) a modified most probable number procedure (MPN) using an alkaline phosphatase-labeled DNA probe (VPAP) to identify suspect isolates (MPN-VPAP); (2) a direct plating method using the same AP-labeled DNA probe (Direct-VPAP) and; (3) another direct plating method utilizing a digoxigenin-labeled probe (Direct-VPDig) to identify suspect colonies. Both DNA probes targeted the thermolabile hemolysin (*tlh*) gene in *V. parahaemolyticus*. *V. vulnificus* counts were determined by two direct plating methods, utilizing AP- and Dig-labeled DNA probes (Direct-VVAP and Direct-VVDig), which targeted the cytolysin-hemolysin gene in *V. vulnificus*. Qualitative changes (opaque/translucent and lipopolysaccharide (LPS) colony types) in *V. vulnificus* were also monitored over time as a function of season and/or time of incubation at 26°C to determine changing trends.

V. parahaemolyticus multiplied rapidly in live oysters held at 26°C; numbers increased 1.9 log₁₀ CFU/g after 10 h (Direct-VPAP counts, April to October). During the months of June through October, these 10 h oyster samples exceeded FDA's limit of 10,000 total *V. parahaemolyticus* counts in retail shellfish. *V. vulnificus* densities increased 1.2 log₁₀ CFU/g between harvest and 10 h at 26°C (Direct-VVAP counts, April to October). Experiments on qualitative changes in *V. vulnificus* isolates showed that opaque colonies predominated throughout the year, and LPS serotype 2 was prevalent in Gulf Coast oysters. There appeared to be a greater percentage of LPS untypeable *V. vulnificus* strains during the winter and after refrigerated storage. The 1/5 LPS type (most common in clinical strains) was not detected during the winter months.

Limiting the amount of time postharvest oysters remain unrefrigerated may decrease *Vibrio* multiplication and possibly reduce the human health risk associated with raw oyster consumption by lowering the dose consumed.

