Developed predictive models for the growth of Vibrio in oysters will assist the seafood industry, regulatory agencies and international organizations for national and international risk assessment in controlling this bacterium in oysters.

Microbial Models of the Effect of Storage Temperature on the Growth and Survival of Vibrio Species in Oysters

Who cares and why?

It has been reported that raw oysters are the main vehicles for the transmission of vibrios to humans. Most of the illnesses occur during the summer, when high numbers of V. vulnificus and V. parahaemolyticus are present in the aquatic environments. Recently, the scientific community, the World Health Organization (WHO), the United Nation's Food Agricultural Organization (FAO) and the U.S. Food and Drug Administration (USFDA) recognized that there is inadequate information about the behavior of V. vulnificus and V. parahaemolyticus in shellfish between harvest and consumption, thereby preventing the design of effective science-based intervention technologies to reduce human exposure to these pathogens and foodborne disease outbreaks. These problems were remedied through the development of predictive models for growth of these bacteria in oysters.

What has the project done so far?

Predictive models for the growth rate of Vibrio bacteria in oysters were developed to understand the behavior of these pathogens in oysters. Additionally, the effects of harvest season, region and water conditions on growth rates were examined.

The effects of storage conditions on sensory and textural characteristics of oysters were investigated. Developed models have been shared with the seafood industry, the U.S. FDA, the FAO, WHO, and organizations in other countries to develop more accurate risk management practices.

Four manuscripts have been published in peer-reviewed journals; 20 abstracts were published and presented at regional, national, and international professional meetings; and one M.S. thesis and one Ph.D. dissertation resulted from this grant.

The project has enhanced the knowledge of 11 educators/scientists, more than 35 graduate and undergraduate students, one research specialist, and one postdoctoral associate on the growth and survival of Vibrio bacteria in oysters.

Impact Statement

Developed and validated predictive models for the growth of Vibrio bacteria in oysters harvested from the Chesapeake Bay and Mobile Bay. Harvest temperature, salinity, region and season had no effect on models.

The results indicate that the length of storage and temperature have a significant effect on bacterial counts and olfactory acceptance of oysters but had an inconsistent effect on texture.

Validated models will assist regulatory agencies, risk managers and the seafood industry in designing more effective food safety systems to control the health risk associated with Vibrio.

The research findings have impact with respect to U.S. FDA proposals to the Interstate Shellfish Sanitation Conference (ISSC) to refine *Vibrio* control plans in the US.

These results demonstrate that the model developed for the growth of Vibrio in Chesapeake Bay oysters is valid for and predictive of growth occurring in oysters harvested from two different estuaries and likely other estuaries with similar environmental conditions.

Want to know more?

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Strategic Priority: Safe secure and abundant food supply

Additional Link: http://www.umes.edu/ard/Default.aspx?id=46285

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