Proposal Subject: Shellstock Cooling Guidance

Specific NSSP Guide Reference: Section IV. Guidance Documents, Chapter III. Harvesting, Handling, Processing, and Distribution .08 Icing, Cold Water Dips and Ice Slurries for Cooling Shellstock

Text of Proposal/ Requested Action

Section IV. Guidance Documents

Chapter III. Harvesting, Handling, Processing, and Distribution

.08 Icing, Cold Water Dips and Ice Slurries for Cooling Shellstock

For States implementing a *Vibrio vulnificus* (*V.v.*) or *Vibrio parahaemolyticus* (*V.p.*) control plan, there exist several options for temperature control to limit post-harvest *Vibrio* growth. NSSP recognized methods of temperature control include ice, mechanical refrigeration, or other approved means capable of lowering and maintaining the temperature of shellstock at 50°F (10°C) or less. The State Shellfish Control Authority is responsible for approving measures used by industry to control shellstock temperature for the purpose of complying with the State's *Vibrio* Control Plan. The desired outcome of temperature control is to inhibit bacterial growth after harvest.

In the past, questions have arisen regarding the efficacy and safety of icing as a means of controlling the post-harvest growth of *Vibrio* species. Icing has long been recognized in the NSSP as an acceptable and effective means of temperature control. The use of ice for temperature control is found throughout the NSSP Model Ordinance (MO). MO Chapter VIII defines temperature control as "*the management of temperature of shellstock by means of **ice**, mechanical refrigeration or other approved means necessary to lower and maintain the temperature of the shellstock to comply with Chapters XI, XIII, or XIV.*" The use of ice is not a new or novel control measure and has been applied effectively by the industry for many years. Several States have established icing shellstock onboard harvest vessels and at landing as a temperature control measure with documented success. Icing shellstock for the purpose of temperature control under a State's *Vibrio* Control Plan should be considered an acceptable practice.

In the past, questions have also arisen concerning the safety of chilled water and ice slurry dips as a means for controlling post-harvest growth of *Vibrio* bacteria. Specifically questioned has been the potential for microbial contamination when oysters are submerged in cold water or ice slurries whereby repeated use of the same

cold water or ice slurry could produce a microbial rich environment, consisting not just of *Vibrio* species but of fecal coliforms and other bacteria as well. Properly maintained, the water temperature of the dip should be sufficiently cold to retard the growth and proliferation of most microorganisms. Maintaining the dip at or below 50°F (10°C) will inhibit growth and proliferation of bacteria. To help ensure that cold water and ice slurry dips do not become overloaded with mud, sediment, and debris, in accordance with MO requirements, shellstock are to be washed making them reasonably free of mud, bottom sediments, and other material. Once removed from warm harvest waters and washed, shellstock placed in cold water or ice slurries close their bivalve shells, cease filtering activity, and can remain closed for extended periods. They generally remain closed and inactive throughout the time needed to cool while held in cold water dips and ice slurries, thereby minimizing the potential for the introduction of *Vibrio* species or other microorganisms during these cooling processes. Additionally, except for naturally occurring bacteria such as *Vibrio* species, oysters harvested from approved areas should not carry with them, or their

sediments, pathogens of public health concern. Furthermore, the use of warm water dips for heat shock, which is typically followed by a cold water dip to rapidly bring shellstock temperature back down, has been a long recognized and accepted NSSP process. The proper use of dips for rapidly cooling shellstock at harvest can be an effective measure to controlling post-harvest growth of *Vibrio* species and should not introduce other public health risks when practiced safely under the approval of the State Shellfish Control Authority. For these reasons, the use of cold water baths and ice slurries should be considered acceptable for controlling the post-harvest growth of *Vibrio* species.

Studies conducted by Texas A&M and the University of Florida Oyster Industry Laboratory have demonstrated that rapid cooling using ice and ice slurries not only prevents the growth of *Vibrio* bacteria, but can reduce *Vibrio* levels in Gulf oysters with no significant increase in oyster mortality. Methods varied from ice slurry dips to ice packing followed by cold storage, using both shucked and live product. The study data clearly suggests that icing and ice slurry dips are effective in maintaining and even reducing *V.v.* and *V.p.* levels after harvest. Additional preliminary studies performed by FDA at the Gulf Coast Research Laboratory in Dauphin Island, Alabama demonstrated no evidence of significant increases in levels of *Vibrio* species, fecal coliforms and other bacterial indicators resulting from ice slurry use.

To help ensure the safe use of ice and rapid cooling dips, the following should be considered:

(1) Water used to wash shellstock free from mud, sediment and other material should be from a potable water source or from a growing area classified as Approved and open to harvest.
(2) Ice should be made from a potable water source and properly protected from contamination prior to use.
(3) Water used in cold water or ice slurry dips should be from a potable water source or from a growing area classified as Approved and open to harvest.
(4) When icing shellstock, proper drainage should be provided to allow gravimetric removal of melting ice.
(5) When recirculated cold water is used to cool shellstock, water temperature should be monitored to ensure proper cooling and water quality should be monitored to ensure against impairment from sediment and particulate buildup due to extended use, which could result in a microbial or filth hazard.
(6) When cooling shellstock in cold water dips, water should be monitored to ensure proper cooling temperatures are maintained and to ensure against impairment from sediment and particulate buildup due to extended use.
(7) When ice slurries are used to rapidly cool shellstock, water quality should be monitored to ensure against impairment from sediment and particulate buildup due to extended use.

As with all control measures, the State must approve prescribed applications for use. It remains the State's responsibility to ensure the safety and efficacy of approved procedures for temperature control. It follows that before approving any system for temperature control, whether onboard harvest vessels, at landing sites, or in processing plants, prospective systems for cooling should be evaluated by the State. Existing guidelines on the safety and quality of ice and water used for cooling shellstock should suffice to address recent questions. Additionally, consultation with FDA Regional Shellfish Specialists or CFSAN is always available to States needing further guidance.

Public Health Significance:	The proposed guidance document provides specific information regarding the safe and effective use of ice, ice slurries and cold water dips for rapidly cooling shellstock. These cooling techniques provide an excellent strategy for effectively controlling post-harvest growth of *Vibrio spp.* When properly applied, these rapid cooling strategies have even been shown to reduce Vibrios to levels below those at the time of harvest.
Cost Information (if available):	
Action by 2013 Task Force II	Recommended adoption of Proposal 13-208 as submitted.
Action by 2013 General Assembly	Adopted recommendation of 2013 Task Force II on Proposal 13-208.
Action by FDA May 5, 2014	Concurred with Conference action on Proposal 13-208.