

Title Quality improvement of shrimp utilizing combined surfactant rinsing and ozonated water treatments
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Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16
 July 2004, Las Vegas, Nevada, USA. 321 pages.
Keyword shrimp; ozone; surfactant

Abstract

The current flood of low cost imported frozen shrimp is seriously threatening the viability of the domestic, wild-caught shrimp industry. Maintaining product quality is critical. Producing high quality raw product with shrimp landed from vessels after days at sea can be difficult. One potential approach is to utilize techniques early in the handling process that destroy spoilage bacteria and maintain quality attributes. Treating shrimp with non-destructive bactericidal processes at vessel unloading may provide sufficient bacteria reduction and improved quality. Food-grade surfactant rinses have been used by industry to decrease organic loads. Treatment with ozonated water has been shown to be an effective antimicrobial process for a variety of food products. This study investigated microbial growth and color changes of applying non-ionic, surfactant spray rinse and ozonated process water to whole and hand-peeled shrimp at vessel unloading, and to mechanically peeled shrimp samples. After unloading, shrimp samples were misted for 30 s with a 1% solution of a proprietary surfactant, and sprayed at 2 ppm for 60 s with ozonated water. Whole shrimp treatments included rinsing only rinsing and spraying with 2 ppm ozonated water, and rinsing and spraying with 3 ppm ozonated water. Treated whole shrimp were also hand peeled and both treatments were repeated on the shrimp meat. Mechanically-peeled shrimp were similarly treated. High variability in bacteria numbers (TPC) was found between untreated individual shrimp (3-5 log), and within most treatment groups. Treating whole shrimp did not decrease bacteria levels. Highly treated hand and mechanically peeled shrimp samples, receiving both surfactant rinsing and 3 ppm ozonated water spray, showed significantly reduced TPCs. However, this reduction was slightly less than one log. None of the treatments produced detectable changes in shrimp meat color. These results indicate that treating whole shrimp at unloading with surfactant rinse and ozonated water is not a useful method to reduce spoilage bacteria, but that further investigation of similar treatment of shelled shrimp meat is warranted.