Evaluation of Techniques Developed for Microbial Safety in Fresh Produce and Seafood

journal or publication title	Report of National Food Research Institute
volume	71
page range	98-98
year	2007-03-01
URL	http://doi.org/10.24514/00002817

doi: 10.24514/00002817

Evaluation of Techniques Developed for Microbial Safety in Fresh Produce and Seafood

MAHMUDA YASMIN
UNU-Kirin Fellow from Bangladesh
Food Hygiene Laboratory

Part-Ⅰ: Microbial Food Safety Research on Cut-Cabbage.

Microbial food safety is an area of increasing concern to consumers. Foodborne outbreaks associated with the consumption of fresh produce and ready-to-eat foods have been documented in recent years. Therefore, we focus on the technology development to secure microbial safety in these foods. In the present study, we examined the effect of transient temperature rise on microbial growth in cut-cabbage and the use of biosensor for visibly detecting inappropriate temperature control attached to the cut-cabbage.

In this study it was found that the natural microflora in the cut cabbage can be kept in the acceptable level by washing with 100 ppm NaOCl solution up to 2 days at 10℃. But when distilled water was used for washing, the bacterial counts exceeded the acceptable level. A 2 hour temperature shift from 10℃ to 25℃ at three different time schedules (4-6 h, 16-18 h, and 24-26 h) during storage was made in order to observe the effect of transient temperature rise on the growth of aerobic as well as coliform bacteria. The results revealed that a 2 h temperature shift-up at any time point does not affect significantly on the growth of natural microflora in either washed or unwashed samples.

The similar experiments were carried out on the cut-cabbage inoculated with *Listeria monocytogenes*,. The population of *L. monocytogenes* was found to increase gradually when incubated at 10℃ temperature but in a rapid rate during incubation at 25℃. When cut cabbage was washed with 100 ppm NaOCl solution, an approximately 1.5 log reduction of L. monocytogenes population was observed. This revealed that sanitization with NaOCl can significantly reduce pathogenic bacteria from cut produce. There was not much difference in the bacterial growth during 10℃ constant temperature and a transient shift-up for 2 hours. The results again revealed that a 2 h temperature shift-up at any time point does not affect significantly on the growth of *L. monocytogenes* in either washed or unwashed samples.

Part-Ⅱ: Evaluation of the multiplex PCR system for simultaneous detection of *Escherichia coli* O157:H7, *Listeria monocytogenes* and *Salmonella* spp. in shrimp samples.

In the second part of the study, an attempt was taken to evaluate the multiplex PCR for the simultaneous detection of *E. coli* O157:H7, *L. monocytogenes* and Salmonella spp in shrimp samples. As the conventional culture method for detection of pathogenic bacteria takes several days to get a confirmed result, a rapid, more reliable and cost effective method for the detection of pathogenic bacteria is necessary. A multiplex PCR detection method can meet this requirement as it is possible to detect more than one pathogen in a single reaction tube. Such a sensitive method has been developed to detect all the three above mentioned pathogen in meat samples in Food Hygiene Team, National Food Research Institute.

In this study, we have evaluated the multiplex PCR system for the detection of *E. coli* O157:H7, *L. monocytogenes* and *Salmonella* spp. in shrimp samples inoculated with these pathogens. We found that this method can detect 1 cell of *E. coli* O157:H7, and *Salmonella* spp. per 25 gram of the inoculated shrimp samples. The PCR assay was also compared with the conventional culture method in detecting all these three pathogens in the imported commercial frozen shrimp samples from Bangladesh. Of the 20 samples tested, none of them were found to be positive by either of the methods. Thus it was concluded hat the multiplex PCR system can be useful to ensure food safety measures.