

Naruemon Jommark 2012: Properties of Neutral Electrolyzed Water and Its Efficiency on Microbial Decontamination of *Litopenaeus vannamei*. Master of Science (Fishery Products), Major Field: Fishery Products, Department of Fishery Products. Thesis Advisor: Assistant Professor Pattama Ratana-arporn, Ph.D. 99 pages.

The objectives of this study were to determine the properties and stability of neutral electrolyzed water (NEW) and its efficiency of microbial decontamination on both pure culture and inoculated shrimp, together with to evaluate the sensory acceptance of treated shrimp. Studies on physicochemical properties of NEW in forms of water and ice including available chlorine concentration (ACC), pH and oxidation-reduction potential (ORP) and its stability during 28 days of storage indicated that ACC tended to decrease during storage in both water and ice after storage. Keeping in closed package in dark atmosphere retarded the loss of ACC level while the ORP and pH of NEW slightly changed, both for initial ACC level of 100 and 200 ppm. In contrast to commercial sanitizer using sodium hypochlorite (NaOCl), markedly reduce in ACC level was observed. NEW presented rather good stability and thus possibly applied for microbial decontamination of fishery products. The result indicated that NEW was highly efficient in killing pure cultures of *Vibrio parahaemolyticus* (VP) and *Vibrio vulnificus* (VV) more than *Salmonella* Enteritidis and *Escherichia coli*. Most of VP cells were immediately inhibited after contact with NEW, while VV cells gradually decreased. In order to completely eliminate 7-log cfu/ml, applying 70 ppm/ 5 min or 100 ppm/ 3 min was enough for VP while 50 ppm/ 3 min or 100 ppm/ 1 min was enough for VV. Investigating the effect of NEW on reduction of VP and VV amount in inoculated shrimps (*Litopenaeus vannamei*), 10 ppm chlorine level (recommended level for water in direct contact with food) and 50 ppm level were used in both water and ice forms. Soaking in 50 ppm/ 15 min or 10 ppm/ 30 min effectively reduced VP contaminated on shrimp by 4.16 log cfu/g, whereas applying in form of ice demonstrated rather low efficiency due to limitation of low temperature condition. In order to achieve food safety purpose, applying 10 ppm/ 30 min was selected. Soaking 10 ppm NEW for 30 min did not alter the sensory quality of shrimps compared to those of tap water ($p > 0.05$). Using NEW with appropriate chlorine concentrations and time could improve quality related to food safety due to pathogenic bacteria like VP and VV in shrimps. Therefore, NEW could be considered as an appropriate alternative sanitizer to improve microbiological quality of seafood.

Student's signature

Thesis Advisor's signature