Title : Effects of pH on the Potential of Chlorine Disinfection Against Pathogenic Bacteria in Broccoli Using Compact Dry Test Kit

Author(s) : **1.** Ms. Orawan Srithinew **Student ID :** 650510200

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Advisor(s) : **1.** Assistant Professor Dr. Pensiri Sriburi

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ABSTRACT

The potential of chlorine disinfection against pathogenic bacteria depends on several factors, especially the pH of the chlorine solution. Therefore, studying the relationship between pH and the appropriate pathogenic bacterial disinfection of chlorine is important in the food production process. This research aimed to study the optimal pH of chlorine at 5.00, 7.00, and 9.00 for disinfecting *Listeria monocytogenes*, *Salmonella* spp., and *Escherichia coli* in the washing process of fresh broccoli prepared by the Catering Department of Thai Airways International Public Company Limited. The broccoli was washed with chlorine at a concentration of 50-100 ppm for 5 minutes, and the bacteria were then enumerated using Compact Dry LM, SL, and EC test kits with 3 replicates for each pH value. Statistical analysis was performed using One-Way ANOVA at a 95% confidence level.

The results showed that chlorine could inactivate *L. monocytogenes* in all samples, whereas *Salmonella* spp. Contamination was found in all samples due to cross-contamination during the experimental procedures. For *E. coli*, it was found that a pH of 7.04±0.10 was the most effective in disinfecting the bacteria, with a remaining bacterial count of 0.50±0.003 Log CFU/g. This was followed by a pH of 5.02±0.07 with a remaining bacterial count of 0.77±1.42 Log CFU/g, and a pH of 9.07±0.14, which had the highest remaining bacterial count of 0.81±0.02 Log CFU/g. However, statistical analysis (p=0.05) showed that washing broccoli with different pH levels resulted in no statistically significant difference. Therefore, it

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can be concluded that a neutral chlorine solution (pH 7.00) is effective in reducing the amount of *E. coli* for the fresh broccoli washing process from the Catering Department. Thus, clean water can be used to prepare the chlorine solution for washing without the need to adjust the pH, which helps reduce time and costs in solution preparation.

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