Thesis Title: Effect of pH and NaCl Concentration on Enteric Pathogens: Salmonella typhimurium, Vibrio parahaemolyticus, Aeromonas hydrophila, Pseudomonas aeruginosa in Fermented Fish

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ABSTRACT

This research was conducted with the purpose of studying the effects of pH and NaCl concentration on the growth of 4 pathogens, namely Salmonella typhimurium ATCC 14026, Aeromonas hydrophila v 270/33 Vibrio parahaemolyticus P 345/33 and Pseudomonas aeruginosa ATCC 27853.It was found that all 4 pathogens thrived well in a Brain Heart Infusion (BHI) broth at 37°c. When NaCl was added to the BHI broth at 0.5%,5%,10%,15%,20% and 25% concentration, it appeared that S. typhimurium and A. hydrophila could survive and thrive at 37°c only at 0.5% and 5% NaCl concentration. However, V.parahaemolyticus and P. aeruginosa could survive and thrive at 0.5%-10% NaCl concentrations. The study on the effect of pH on the growth of the 4 pathogens was carried out by adjusting the pH (5.0,6.0,7.0 and 8.0)

of the BHI broth with various NaCl concentrations. It was discovered that S. typhimurium thrived well at 0.5% - 5% NaCl concentrations at pH of 5.0 - 7.0, while A. hydrophila thrived at 0.5% - 5% NaCl concentrations with a pH of 7.0, V. parahaemolyticus thrived at 0.5% - 10% NaCl concentrations with a pH at 7.0 - 8.0 while P. aeruginosa was able to thrive only at 0.5% - 10% NaCl concentrations with a pH of 7.0.

The study was then conducted on fermented fish using verying NaCl concentrations and pH levels to detect the growth and survivability of the 4 pathogens. The results showed that S. typhimurium could be survive for 6 days at 5% and 8% NaCl concentrations with pH at 6.0 - 6.5 and it could survive for 4 days at 10% - 15% NaCl concentrations and only 2 days at 20% - 25% NaCl concentrations. A. hydrophila was able to thrive as long as 12 days at 5% and 10% NaCl concentrations at pH 7.0 - 7.5, 10 days at 10% NaCl concentration, 6 days at 15% NaCl concentration and 4 days at 20% and 25% NaCl concentrations. P. aeruginosa stayed alive for 8 days at 5%-8% NaCl concentrations at a pH of 7.0 - 7.5, 5 days at 10% - 15% NaCl concentrations and 4 days at 20% - 25% NaCl concentrations. V. parahaemolyticus which is a halophilic and alkaline preferably bacteria was able to thrive for 4 days at 5% - 20% NaCl concentrations and only 2 days at 25% NaCl concentration because the pH levels were between 5.5 to 6.0.