Phadungdet Poolsuk 2009: Empirical Models for Predicting the Growth of *Vibrio parahaemolyticus* in Frozen White Shrimp. Master of Science (Agro-Industry Technology Management), Major Field: Agro-Industry Technology Management, Department of Agro-Industry Technology. Thesis Advisor: Assistant Professor Ravipim Chaveesuk, Ph.D. 110 pages.

This objective of this research was to examine the potential use and performance comparison of 3 empirical models in modeling the growth of *Vibrio parahaemolyticus* in the frozen white shrimp, namely regression, backpropagation neural network (BPN) and radial basis function neural network (RBFN). Three modeling growth patterns with an initial load of *Vibrio parahemolyticus* in the range of 2 -5 logMPN/g studied were the growth model (at 20, 37 and 44 degree Celsius), the death model (at -20, -10, 0, 4 and 10 degree Celsius) and the complete growth-death model. Model performances were compared based on their prediction accuracy in terms of mean absolute error (MAE) and model bias in term of tracking signal (TS). The results showed that the growth models possessed higher prediction accuracy than the death models and the complete growth-death models. The BPN models exhibited higher prediction accuracy and generalization capability than the regression models and RBFN models regardless of types of modeling growth patterns. The best growth model, the death model and the complete growth-death model were 3-3-1 BPN, 3-9-1 BPN and 3-7-1 BPN, respectively with the MAE of a validation data set of 0.6, 0.7 and 1.2 logMPN/g, respectively. In addition, these BPN models were of unbiased modeling type. Their biases in terms of TS were -4.7, 2.8 and 1.1 for the growth model, the death model and the complete growth-death model, respectively.

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