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Comparison of Secondary Models for Modeling the Growth of *Salmonella* in Leafy Greens

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Abstract

An estimated 550 million individuals worldwide suffer from food-related illnesses, which also cost the economy billions of dollars annually and result in 230,000 fatalities. If it were possible to identify and track the growth or survival of pathogen microorganisms, these illnesses and expenses might be decreased. However, monitoring the development or survival of bacteria using traditional microbiological methods is very expensive and labor-intensive, and the knowledge gained is not cumulative. Instead of employing conventional microbiological techniques, predictive microbiology has been created to forecast microbial behavior during food processing using precise and adaptable mathematical models. Primary, secondary, and tertiary models are the three general categories into which mathematical models fall. Secondary models examine how parameters that appear in primary modeling approaches change in response to one or more environmental factors, such as pH, temperature, etc. In order to ascertain which secondary models were most suitable for Salmonella in leafy greens, this study compared the suboptimal Ratkowsky square-root, suboptimal Huang square-root, Cardinal, and Arrhenius-type models. The best model to fit data on the maximum growth rate as a function of temperature, according to the findings of the current study, was the Arrhenius-type model. These findings shed light on predictive microbiology and aid researchers and food microbiologists in selecting the best secondary growth prediction model.

Key Words: *Food safety, Foodborne outbreaks, pathogens, Predictive microbiology, lettuce*