Title	Variation among Batches of Freshly Ground Chicken Breast Meat Complicates the Modeling of *Salmonella* Growth Kinetics
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Abstract

The objective of the current study was to develop and verify a tertiary model for predicting the high-density (3.7 log CFU/g) growth of *Salmonella* on freshly ground chicken breast meat as a function of time and temperature. A multiple antibiotic resistant strain of *Salmonella typhimurium* was inoculated onto the surface of one-g portions of freshly ground chicken breast meat. Changes in pathogen density over time of incubation at 10 to 40°C were assessed by viable cell counts on a selective medium with four antibiotics. Kinetic data were fit to the modified Gompertz primary model to determine lag time (LT), maximum specific growth rate (SGR) and the total log cycles of growth (C). Secondary models for LT, SGR and C as a function of temperature were developed and combined with the primary model in a computer spreadsheet to create the tertiary model. Ability of the tertiary model to predict the CFU data (n = 928) used in model development (verification) was evaluated using the recently published acceptable prediction zone method. The proportion of prediction errors (pD) that fell in an acceptable prediction zone from a log cycle difference (D) of -0.5 (fail-safe) to 0.25 (fail-dangerous) was 0.552, which was below he acceptable value of 0.700 for pD. The failed verification of the tertiary model was not explained by performance of the primary model, which had an acceptable pD of 0.934, or by improperly fitting secondary models. Rather, it resulted from variation of *Salmonella* growth kinetics among batches of ground chicken.