Abstract

The objectives of this study were to investigate the efficacy of two sanitizers, i.e. hypochlorous and peracetic acids, in reducing coliforms and Escherichia coli levels on tomato fruits and lettuce leaves, and to mathematically predict the relationship among the initial bacterial load, type of vegetable/fruit, types and concentration of sanitizer and residual microorganism levels after the sanitizing, by applying artificial neural networks (ANNs). The *E. coli* and coliforms used in this study were isolated from the two food types, and their cultures were activated in Tryptic Soy Broth (ca. 6–7 $\log_{10}$ cfu/ml) before inoculating onto the fruit and vegetable. Both sanitizers reduced the number of the micro-organisms. However, as the hypochlorous acid concentration was increased, the level of viable coliforms and *E. coli* on the tomato fruits was reduced around 2–3 $\log_{10}$ cfu/g (p $\leq$ 0.05), compared to only about 1 $\log_{10}$ cfu/g reduction on lettuce leaves (p $\leq$ 0.05). Conversely, when the peracetic acid concentration was increased, the coliforms and *E. coli* levels on tomato fruits were reduced by some 3–4 $\log_{10}$ cfu/g (p > 0.05) compared to only about 2 $\log_{10}$ cfu/g on lettuce leaves (p > 0.05). The best sum square error from the neural prediction of residual coliforms and *E. coli* were 0.50 and 0.84, respectively, and the maximum R2 of residual coliforms and *E. coli* were 0.85 and 0.72, respectively. Only one hidden layer with three hidden neurons for coliforms and five for *E. coli*, were required to model this data.