Title	A novel approach for calculating shelf life of minimally processed vegetables
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Abstract

Shelf life of minimally processed vegetables is often calculated by using the kinetic parameters of Gompertz equation as modified by Zwietering et al. [Zwietering, M.H., Jongenburger, F.M., Roumbouts, M., van't Riet, K., 1990. Modelling of the bacterial growth curve. Applied and Environmental Microbiology 56, 1875–1881.] taking 5×10^7 CFU/g as the maximum acceptable contamination value consistent with acceptable quality of these products. As this method does not allow estimation of the standard errors of the shelf life, in this paper the modified Gompertz equation was re-parameterized to directly include the shelf life as a fitting parameter among the Gompertz parameters. Being the shelf life a fitting parameter is possible to determine its confidence interval by fitting the proposed equation to the experimental data. The goodness-of-fit of this new equation was tested by using mesophilic bacteria cell loads from different minimally processed vegetables (packaged fresh-cut lettuce, fennel and shredded carrots) that differed for some process operations or for package atmosphere. The new equation was able to describe the data well and to estimate the shelf life. The results obtained emphasize the importance of using the standard errors for the shelf life value to show significant differences among the samples.