Title Respiration model for fresh-cut products as a function of degree of cutting

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Abstract

The Michaelis-Menten type respiration model for fresh-cut products was used to describe the effect of cutting, the respiration rates of four sizes of green pepper, eggplant and cucumber slices at different O_2 partial pressures, using a flow through system at 20°C. The degree of cutting (*D*-value) was quantified by determining the surface area created through cutting per unit weight of the product. CO_2 production decreased in response to decreasing O2. In addition, increases in *D*-value resulted in increased respiration rates. The Michaelis-Menten type equation was fitted to each data set of different cutting sizes using nonlinear least squares method, and the parameters K_m and V_{max} were estimated. With an increase in *D*-value, K_m decreased and V_{max} increased, but at a higher range of *D*-value, both parameters approached constant values. The dependencies of both these parameters on *D*-value could be expressed by exponential equations. The extended Michaelis-Menten type respiration model provided a good prediction of respiration rate of fresh-cut products at any O_2 partial pressure and degree of cutting.