

**Title** Modelling the respiration rate of guava (*Psidium guajava* L.) fruit using enzyme kinetics, chemical kinetics and artificial neural network

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#### **Abstract**

The respiration rate prediction of fresh produce is crucial for designing and operating postharvest storage systems. This paper constructs and evaluates respiration models of guava fruit by using not only the enzyme, chemical kinetics but also artificial neural network (ANN) with the experimental data obtained from 5, 10, 15, 20, 25 and 30 °C (for constructing) as well as 12 and 22 °C (for evaluating) by closed system method. All of the developed models showed good agreement with actual observations. As regards fidelity the ANN model with topologic structure of  $3 \times 9 \times 1$  trained by the Levenberg–Marquardt algorithm, evaluation results were such that the mean absolute percentage error (MAPE) and the two-tailed Pearson correlation coefficient ( $r$ ) were 5.31 and 0.997 for 12 °C, 4.85 and 0.995 for 22 °C, had superiority over the two other models. The results indicate that the ANN approach is a more precise method, and can be used for predicting the respiration rate of guava fruit.

<http://www.springerlink.com/content/p533111565205406/fulltext.pdf>