

Modelling the kinetics of peroxidase inactivation and colour changes of seedless guava (*Psidium guajava* L.) during thermal treatments

ABSTRACT

The kinetics of thermal inactivation of peroxidase and colour changes in seedless guava (*Psidium guajava* L.) due to hot water blanching were studied in the temperature range of 80-95°C. Peroxidase inactivation kinetics followed a first-order Arrhenius model, where the activation energy and rate of the reaction at a reference temperature of 87.5°C were 101.27 ± 3 kJ mol⁻¹ and $0.023 \pm 4 \times 10^{-3}$ s⁻¹, respectively. Colour was quantified using the L, a, b in Hunter system. The results indicated that colour system parameters (L, a, b) followed a first-order Arrhenius kinetics model with activation energies (E_a) of 120.43 ± 3 , 86.45 ± 5 and 100.03 ± 2 , kJmol⁻¹, respectively. The zero-order kinetic model was applied to total colour difference (TCD) resulting in activation energies of 111.65 ± 5 kJmol⁻¹. Good agreement was found between estimated and experimental data in all cases ($R^2 > 0.91$).

Keyword: Blanching; Colour; Kinetic modeling; Peroxidase inactivation; Seedless guava