

## 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  $101.27 \pm 3$  kJ mol<sup>-1</sup> and  $0.023 \pm 4 \times 10^{-3}$  s<sup>-1</sup>, 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  $120.43 \pm 3$ ,  $86.45 \pm 5$  and  $100.03 \pm 2$  kJ mol<sup>-1</sup>, respectively. The zero-order kinetic model was applied to total colour difference (TCD) resulting in activation energies of  $111.65 \pm 5$  kJ mol<sup>-1</sup>. 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.