

Title Kinetics of quality changes of pumpkin (*Curcubita maxima* L.) stored under isothermal and non-isothermal frozen conditions

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Abstract

The effects of freezing process and frozen storage at isothermal (-7 , -15 and -25 °C) and non-isothermal (accelerated life testing with step-stress methodology; temperature range from -30 to -5 °C) conditions on pumpkin quality were investigated. Storage temperature conditions were selected to embrace the limits practiced in the cold chain. Quality changes, such as texture, colour CIE *Lab* and vitamin C (ascorbic acid) content, were evaluated for both frozen storage regimes. The freezing process (that included a pre-blanching step) and subsequent frozen storage had significant impacts on all quality parameters analysed.

A fractional conversion kinetic model was adequate in colour, texture and vitamin C data fits. The storage temperature effect was successfully described by the Arrhenius law.

This study shows that non-isothermal frozen storage has a marked effect on pumpkin quality.