

Title Determination of shelf-life of homogenized apple-based beikost storage at different temperatures using Weibull hazard model

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Abstract

A shelf-life model based on the storage temperature was developed for a homogenized fruit-based baby food. Bottles of apple compote for infant feeding were collected from a food company and stored at three different temperatures (23, 30 and 37 °C) during 420 days. CIELAB color space parameters, vitamin C, 5-hydroxymethylfurfural were measured and sensory analysis (sensory attributes and overall acceptability) was carried out during the length of the study. Weibull Hazard Method was utilized to set the shelf-life end-point of the product at 37 °C according to overall acceptability score given by the sensory panel. Considering a 50% probability of panellists to find the product as being unacceptable, the end of shelf-life for the apple-based beikost stored at 37 °C was achieved after 346 days. The statistical analysis of the data enabled us to select the most adequate zero- and first-order kinetic equations for both physicochemical and sensory attributes in samples stored at 37 °C. Color CIELAB parameters, vitamin C and sensory attributes (color and taste) were selected as the critical parameters. Their rejection times at 23 and 30 °C storage temperatures were obtained by extrapolation of the results given by Weibull method at 37 °C. Finally, rejection times for critical parameters were used to propose a shelf-life equation that showed 4.5 and 3.4 years of shelf-life when stored at 20 and 23 °C, respectively.