Milled Rice Physical Properties after Various Radio Frequency Heat Treatment

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Abstract

The purpose of this research was to study the effect of the radio frequency (RF) heat treatment on the quality of milled rice cv. Khao Dawk Mali 105. The experiment was conducted at the RF laboratory in the Postharvest Technology Institute, Chiang Mai University, Chiang Mai (Thailand). Milled rice samples, each of 500 g, were treated by the RF frequency at 27.12 MHz for 3 minutes at five different temperatures (room temperature, 45, 60, 75 and 90°C, respectively). Milled rice quality was evaluated, e.g. physical properties (grain colour, moisture content), cooking quality (hardness and stickiness) and the processing quality (pasting properties, viscosity). SPSS was used to analyse the variance of the data.

The results showed that treatment temperatures higher than 60°C affected the colour of the milled rice, e.g. lightness (L*-value) and yellowness (b*-value) increased. Also the cooking quality was influenced to that effect that the kernel hardness increased while the stickiness decreased. The pasting properties and especially the viscosity decreased too as they were determined by means of peak viscosity, through, breakdown, final viscosity and setback. The RF treatment at 90°C caused the strongest changes in milled rice quality. However, for most of the studied properties no significant differences were found if treatments at temperatures below 60°C were compared.

The results of our research are the first and need validation. Furthermore, for future research the evaluation of the sensory quality should be included.

Keywords: Hardness, milled rice, radio frequency, stickiness, viscosity

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