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Influence of drying temperature on drying behaviour and quality of mango kernels

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Abstract

One of the main by-products of mango production are the kernels. To utilise the mango kernels, drying is an important step for later applications. In this study, the effect of different drying temperatures on drying behaviour and some quality parameters of mango kernels was investigated. Mango fruits cv. Kent originally from Brazil were used in this study. The drying experiment was conducted at temperatures of 40, 50 and 60 °C using a high precision laboratory dryer. Air velocity and absolute humidity of the air were held constant at 0.2 m s^{-1} and 10 g kg^{-1}, respectively. Mass loss from the mango kernels was recorded at constant intervals of 5 min. Furthermore, the quality of dried mango kernels was determined in terms of colour, total phenolic content, flavonoids and total tannin content. The results showed that the moisture content decreased gradually until the desired moisture content of 9 % was accomplished. With an increase in the temperature, the total drying time decreased remarkably. Colour of the mango kernels was substantially influenced during the drying process. Although, there were no significant differences in colour parameters (L*a*b*) among mango kernels dried at different temperatures at $p < 0.05$. The mango kernels dried at 60 °C showed the highest total phenolic content (83.4 ± 2.9 GAE mg g^{-1} of the dried sample), flavonoids (63.3 ± 1.5 mg g^{-1} of the dried sample), and tannin content (77.3 ± 1.5 mg g^{-1} of the dried sample) compared to those dried at the other temperatures ($p < 0.05$). It was observed that the choice of the drying temperature could change the ingredients of the mango kernels. In addition, a drying temperature of 60 °C was found to be the optimal operating temperature for mango kernels regarding their quality and drying time.

Keywords: Drying, mango kernels, processing temperature, utilisation

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