

INFLUENCE OF DRYING PARAMETERS ON BETA CAROTENE RETENTION IN MANGO LEATHER

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ABSTRACT

Dried mango slices are a common snack product in Southeast Asian countries. Due to its high β -carotene content of 2,500 to 4,000 $\mu\text{g}/100\text{g}$ it is an important source of provitamin A. However, processing requires mature and regular shaped fruits of a certain size. Slicing mango flesh causes losses up to 30 %. Mashing the mango flesh and drying the puree to mango leather is a promising alternative to utilise even over-mature fruits, small fruits and fruits with irregular size as cheap raw material. In addition, the processing losses can be reduced to about 10 %.

Within the study the impact of blanching as well as of the drying air temperature (40 – 90 °C) on the drying time was investigated. Drying tests were conducted using a laboratory dryer which allows continuous measurement of the drying rate. The quality of the mango leather was evaluated in terms of colour and β -carotene content. The formation of 13-*cis* β -carotene isomers was used to indicate thermal β -carotene degradation. The tests have shown that blanching leads to a significant reduction of the drying time, less browning reactions, but also reduces the β -carotene content considerably. Optimum drying conditions in terms of drying time, colour and β -carotene retention were determined at 80 °C. 75 % of the all-*trans* β -carotene content, related to dry weight, could be maintained and no decrease of colour saturation could be observed. As a result it can be expected that a drying air temperature of 80 °C is sufficient to inactivate carotenoid oxidising enzymes, i. e. lipoxigenase, without showing significant negative thermal effects. Higher temperatures of 90 °C lead to a significant degradation of β -carotene. Lower temperatures increase the drying time, cause discolouration and in addition decrease the β -carotene retention. Blanching reduces drying time to about 20 %, prevent browning reactions but halved the all-*trans* β -carotene content of the undried puree.

With an average of provitamin A activity of 600 to 650 RE mango leather is a suitable source of provitamin A and could have a significant impact to prevent vitamin A deficiencies in Southeast Asian countries.