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Quality Evaluation of Hot Air-Dried Mangoes through Heat-Sensitive Enzymes

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Abstract

Mango fleshes has a great importance due to its rich nutritional value as well as being a good source of enzymes. Presently, different heat processing techniques are being used to preserve mango for longer shelf life. Drying at a higher temperature not only decreases the nutritional value of the dried fruit but can also cause the destruction of the enzyme active sites. Thus, to assure the production of high value dried product, a new system to test the quality of the dried fruit needs to be developed and drying techniques need to be optimised. In this study, the activity of heat sensitive enzymes (HSE) was estimated to test the quality of hot air dried mango. The selected mango varieties (S. B. Chaunsa, Sindri) from Pakistan and Tommy Atkins from the local market of Stuttgart were obtained and dried with a hot air oven (40°C, 50°C, 60°C, 70°C and 80°C). The system was operated in over-flow mode and samples were dried to the target moisture level below 15 % (d.b.) with $a_w \leq 0.6$. The differences between the variables were tested for significance level (α=0.05) by one-way ANOVA and Tukey's HSD post hoc multiple range test. During drying, the activity of HSE in all three mango varieties was significantly ($p < 0.05$) decreased (45–97 %). However, the maximum activity of HSE (45–68 %) was attained when drying at 40°C while the lowest one (3–13 %) was at 80°C. From the results, conclusions can be drawn about drying temperature favourable for high enzyme retentions or for high enzyme degradations. The residual enzyme activity in the dried sample can be used as a parameter to provide information about the drying operational temperature and ultimately about the product quality.

Practical Application

The research work can be used in the drying industry to test the quality of the dried mangoes.

Keywords: Heat processing techniques, heat-sensitive enzymes (HSE), hot air oven drying (over-flow), residual enzyme activity

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