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Comparative biochemical, anti-oxidative and sensory attributes of freeze-dried and air-dried 'chandler' strawberry fruit

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Abstract

Strawberry fruit is praised for refreshing taste and rich nutritive value but with high perishable fruit quality after harvest. Ultimately, processing techniques like drying reduces rapid postharvest quality and nutrition losses in strawberry. However, various drying techniques affect the produce quality and nutrition. So, a study was executed to compare the efficacy of two fruit drying techniques for strawberry fruit. Fruit of 'Chandler' strawberry were harvested at commercial maturity and were subjected to freeze drying (-60 °C for 24 hours) and hot air drying (60 °C in and electric de-humidified dryer for 24 hours). In another experiment, in addition to that efficacy of fruit cut techniques were also evaluated for both drying techniques. Strawberry fruit were cut into four different types of cut (T1= whole fruit of strawberry, T2= strawberry fruit without pedicle, T3= fruit pedicle + cortex removed, T4= fruit pedicle + cortex removed & fruit cut into half) prior to drying. The dried fruit were investigated for various biochemical [total soluble solids (TSS), titratable acidity (TA), ascorbic acid contents], anti-oxidative [total phenolic contents (TPC), total anti-oxidative activity, activities of superoxide dismutase (SOD), catalase (CAT) and peroxidase (POD) enzymes] and sensory attributes (colour, taste, texture and overall acceptability). The results indicated that irrespective to type of cut, freeze-dried strawberry exhibited comparatively better fruit quality attributes as compared to air-dried strawberry. Freeze-dried strawberry retained higher anti-oxidative attributes including ascorbic acid contents (63 mg 100 g^{-1} FW), TPC (111 mg GAE g^{-1} FW), total anti-oxidative acidity (83 inhibition % DPPH) and exhibited better fruit sensory characteristics fruit texture (7.9 score), flavor (8.3) and overall-consumer acceptability (8.9 score) as compared to air dried strawberry fruit. The fruit cut method T4 (fruit pedicle + cortex removed & fruit cut into half) improved drying efficiency both for freeze-drying and air drying method. Conclusively, freeze-dried strawberry retained significant better fruit quality attributes as compared to air dried strawberry.

Keywords: Dehydration techniques, fresh cut fruit, fruit preservation, fruit quality

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