

Effect of drying conditions on ascorbic acid content of spinach

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■ **ABSTRACT** : Fresh spinach were dehydrated in mechanical tray dryer and open sun drying after pretreatment by (i) Dipping in solution containing 0.1% magnesium chloride, 0.1% sodium bicarbonate and 2% potassium metabisulphite in distilled water for 15 min. at room temperature (ii) Blanching in boiling water for 2 min (iii) Blanching in boiling water containing 0.5% sodium metabisulphite for 2 min. The ratio of spinach to pretreatment mixture was maintained at 1:5 (w/w). Pretreated spinach samples were dehydrated in mechanical tray dryer at 40, 50, 60 and 70°C temperatures and in open sun drying with loading density 2.0, 2.5 and 3.0 kg/m². It was found that maximum ascorbic acid content (36.893 mg/100g) was in chemical treated sample dried at 40 °C temperature and 3.0 kg/m² loading density whereas minimum (25.591mg/g tissue) was obtained in blanched sample dried at 70 °C and 2.0 kg/m² loading density in tray dryer. However, in case of open sun drying, the maximum (16.637 mg/g tissue) and minimum (11.775 mg/g tissue) was obtained in chemical treated and 3.0 kg loading density and blanched sample and 2.0 kg loading density, respectively, The loss in ascorbic acid content when compared with fresh sample was found in the range of 50.295% to 65.522% which indicates more losses at higher drying temperatures. The maximum value corresponds to the processing condition of temperature 50 °C, chemical treated sample at 2.5 kg/m² loading density having a score of 9.0, while corresponding conditions for minimum score were for 70 °C and blanched at 3.0 kg/m² loading density. It was observed that at lower temperature colour was acceptable. Further, best three samples were chosen from sensory evaluation for 180 days storage period. The total loss of ascorbic acid during storage were found as 65.195%, 60.719% and 64.701% in 50 °C, 2.5 kg/m² loading density, chemical treated, 40 °C, 3.0 kg/m² loading, density chemical treated and 60 °C, 2.0 kg/m² loading density, chemical treated samples, respectively. The product quality on the basis of sensory evaluation and storage were found to be most acceptable when spinach were treated with solution of 0.1% MgCl₂ + 0.1% NaHCO₃ + 2% KMS, with dried at 50 °C and 2.5 kg/m² loading density.

■ **KEY WORDS** : Blanching, Loading density, Tray dryer, Open sun, Rehydration ratio, Coefficient of rehydration, Moisture contents

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