C026256 : FOOD TECHNOLOGY
KEY WORD : OSMOTIC DEHYDRATION/PINEAPPLE

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132 pp. ISBN 974-581-202-1

The effects of type and concentration of sugar solution, temperature and immersion time on water loss and solid gain in the osmotic dehydration of pineapple were studied. Response Surface Methodology was applied to determine the optimum condition (maximum water loss and minimum solid gain) for each sugar solution, (sucrose, glucose syrup and liquid glucose) concentration of sugar solution (X_1) 50° - 70° Brix, temperature (X_2) 30° - 70°C and immersion time (X_3) 4-8 hours. The second order model was fit to describe interrelation between water loss, solid gain and three independent variables as following :-

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_{11}X_1^2 + B_{22}X_2^2 + B_{33}X_3^2 + B_{12}X_1X_2 + B_{13}X_1X_3 + B_{23}X_2X_3$$

where Y is water loss or solid gain, B_0 is a constant and $B_1 \ldots B_n$ are regression coefficients. The second order models were used to develop contour plots. The optimum conditions for different sugar solution were as the followings : the maximum water loss were 42, 44 and 44 g H_2O/100g pineapple while the minimum solid gain were 21, 10 and 26 g solid/100g pineapple for sucrose solution 65°Brix, at 70°C for 6 hrs, glucose syrup solution 61°Brix at 70°C for 8 hrs and liquid glucose solution 62°Brix at 70°C for 6 hrs, respectively. The osmotic dehydrated pineapple were further dried both in hot air oven and vacuum oven at 70°C and evaluated for organoleptic properties. Results from taste panel evaluation indicated that sucrose concentrated pineapple was highest acceptable and drying conditions did not have significant effect on organoleptic properties.

Furthermore, water loss/solid gain ratio on quality of sucrose concentrated pineapple was studied. Sensory evaluation showed that dehydrated pineapple at ratio 2.6, 2.7 and 2.8 gave significantly higher scores than at lower ratio 2.2 and 2.4. Therefore, osmotic dehydration of pineapple in sucrose solution at water loss/solid gain ratio 2.6, 2.7 and 2.8 before further drying were most suitable conditions.