

Thesis Title	Drying of mango glace' by heat pump
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Abstract

The objectives of this research were to investigate parameters affecting drying rate of mango glace' and to find a suitable condition for drying with a 3.5 kW heat pump.

In this experiment, mango glace' with concentration of 60° brix was used. Equilibrium moisture content was determined by static method. Saturated salt solution was employed to control relative humidity. Equilibrium moisture content found to decreased with temperature for relative humidity ranging from 10-60 %. The Brunauer et al. (BET) equation was found accurately to described the experimental results. Results obtained from heat pump drying experiment indicated that diffusion coefficient increased exponentially with drying temperature, density decreased linearly with moisture content, and specific heat increased linearly with moisture content of mango glace'. The conditions for heat pump drying of mango glace' were as follows : close loop with drying air temperature of 50°C, initial weight 40 kg, by pass air 63 %, air flow rate 0.321 – 0.428 kg/s, average mango glace' dimension $2.8 \times 6.5 \times 0.5$ cm³, initial and final moisture contents were 85 % and 18 % d.b., respectively. The results were as follows : drying rate was 0.428 kg water/h, moisture extraction rate from evaporator was 0.434 kg water/h, energy consumption was 10.99 MJ/kW-h or SMER (Specific moisture extraction rate) was 0.328 kg water evap./kW-h at minimum specific air flow rate of 53.45 kg dry air/h-kg dry mango glace'. The coefficient of performance of heat pump (COP_{hp}) varied from 3.70 to 4.65. The quality of mango glace' after drying was acceptable in industrial

product standard with light reddish - orange colour (Code 34-C from R.H.S colour hart), dry surface, and good and uniform shape

Keywords : Dehydration / fruit / heat pump