

Optimization of spray drying parameters for white dragon fruit (*Hylocereus undatus*) juice powder using response surface methodology (RSM)

ABSTRACT

This study was conducted to optimize the production of spray-dried white dragon fruit (*Hylocereus undatus*) powder using resistant maltodextrin as wall material. The inlet air temperature (140 °C, 150 °C and 160 °C), outlet temperature (75 °C, 80 °C and 85 °C) and resistant maltodextrin concentrations (20%, 25% and 30%) were tested as independent variables. Process yield, moisture content, water activity, solubility, hygroscopicity and bulk density of the powders were analysed as responses. Process yield significantly ($p < 0.05$) increased with increasing inlet temperature and decreasing resistant maltodextrin concentration. Outlet temperature and resistant maltodextrin concentration significantly ($p < 0.05$) reduced the moisture content and water activity of the white dragon fruit powder. Powder solubility and hygroscopicity significantly ($p < 0.05$) increased as inlet and outlet temperature increased. Bulk density values decreased as inlet and outlet temperature increased. An optimum conditions for spray dried white dragon fruit powder that would produce high in yield, low moisture content, low water activity, high solubility, low hygroscopicity and high bulk density were found at 153 °C inlet temperature, 82 °C outlet temperature and 20% concentration. *C. gloeosporioides*, at 60.18% and 66.52% of inhibition of radial growth, respectively.

Keyword: Dragon fruit; Resistant maltodextrin; Powder; Response surface methodology; Spray drying