

Spray-drying optimization for red pitaya peel (*Hylocereus polyrhizus*).

ABSTRACT

Optimization for the spray-drying of pitaya peel (*Hylocereus polyrhizus*) was carried out using the central composite design (CCD) of the response surface methodology to study the effect of inlet air temperature (155–175 °C), outlet air temperature (75–85 °C), and maltodextrin DE10 concentration (8–22% w/w) on the pitaya peel powder characteristics. Spray-dried pitaya peel powders had high betacyanin retention and low water activity and had desirable color, solubility, and hygroscopicity properties. Significant ($p < 0.05$) response surface models with high coefficients of determination values ($R^2 > 0.85$) ranging from 0.896 to 0.979 fitted for the experimental data were obtained. The linear term of maltodextrin concentration was found to be the most significant ($p < 0.05$) variable influencing the powder characteristics, and the outlet temperature had the least effect. The overall optimum region for the spray-drying of the desirable pitaya peel powder was predicted at a combined parameter of inlet air temperature at 165 °C, outlet air temperature at 80 °C, and maltodextrin DE10 at 15% (w/w).

Keyword: Pitaya peel; Spray-dried; Optimization; Powder characteristics.