

Optimization of spray drying parameters for pink guava powder using RSM

ABSTRACT

The optimization of pink guava was executed using central composite face-centred design to optimize the spray drying parameters of inlet temperature, maltodextrin concentration (MDC) and feed flow (FF). The experimental results were significantly ($p < 0.01$) fitted into second-order polynomial models to describe and predict the response quality in terms of the final moisture, particle size and lycopene with R^2 of 0.9749, 0.9616, and 0.9505, respectively. The final moisture content significantly ($p < 0.01$) decreased with increasing inlet temperature and MDC, whereas the particle size increased. In contrast, the lycopene content significantly ($p < 0.01$) decreased with the higher temperature and increased with increasing MDC. However, according to multiple response optimization, the optimum conditions of 150°C inlet temperature, 17.12% (w/v) MDC and 350 mL/h FF-predicted 3.10% moisture content, 11.23 μm particle size and 58.71 mg/100 g lycopene content. The experimental observation satisfied the predicted model within the acceptable range of the responses.

Keyword: Pink guava; Maltodextrin; Spray drying; Optimization; Lycopene