

Effect of maltodextrin concentration and slurry temperature on pineapple powder using ultrasonic spray dryer

ABSTRACT

In order to prolong the shelf life of the pineapple, one of the methods that can be applied is spray drying. Ultrasonic Spray Drying (USD) relies on an electromechanical device that vibrates at a very high frequency. The main objective of this work is to study the effect of maltodextrin concentrations and pre-heat slurry temperature in order to improve pineapple powder yield and moisture content. The spray dryer model used was equipped with ultrasonic system and the samples were run at different preheat slurry temperatures of 30° C, 40°C, and 50°C. Maltodextrin (MD) was used as a carrier agent at different concentrations ranging from 10% to 30% w/w. The pineapple powder then was analyzed for its yield, moisture content and colour. It was found that at higher pre-heat slurry temperature and MD concentration, the drying yield of pineapple powder had also increased. The moisture content of pineapple powder decreased with an increase of preheat slurry temperatures and MD concentration. The pineapple was found to be spray dried best at 40°C pre-heat slurry temperature with 20% w/w MD concentration highest yield recorded was 127 g. It was observed that the lightness colour of the powder is the highest at 40°C of slurry temperature and 20% w/w MD concentration. The pineapple slurry with high water to pineapple ratio resulted in low moisture content. In addition, the result shows that an increased amount of pineapple slurry and MD concentrations gives higher pineapple powder.

Keyword: Maltodextrin; Moisture content; Pineapple; Powder; Ultrasonic spray dryer