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EFFECT OF FEED FLOW RATE and ADDITION OF MALTODEXTRIN TOWARDS SPRAY DRYING OF PINEAPPLE

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ABSTRACT

Moris pineapple is a well known highly valuable fruit that contain a lot of vitamins. Due to the high sugar and moisture content, the shelf life of this fruit is quite short. Nowadays, fast technology development has brings a new innovation in the trend of food consumption by converting raw material of fruit to powder. The purposes of this study are to study the effect feed flow rate for flesh, pulp and skin pineapple spray drying and to study the physicochemical properties of pineapple powder due to variety of maltodextrin amount. Samples of pineapple powder were produced using the LabPlant SD-Basic Spray Dryer under two different conditions. Slurry of flesh, pulp and skin of pineapple were added with 15%, 20% and 25% concentration of maltodextrin (MD) before feeding to the spray dryer at fixed temperature 130°C using 3, 4 and 5 speed pump. The powder were then analysed for moisture content and glass transition temperature, Tg. The physicochemical properties such as total soluble solids (TSS) and Titratable Acidity (TA) were also determined. The highest yield of powder produced at speed pump 3 which is in the range of 0.45 L/hr to 0.60 L/hr feed flow rate with 25% addition of maltodextrin. Results showed that lower feed flow rate and increment of maltodextrin content decreasing the moisture content of pineapple powder. Glass transition temperature increase as the concentration of maltodextrin increase. TA were significantly decreased as the concentration of maltodextrin increased. TSS in pineapple juice significantly increases when turn into powder but was not affected by the increment of maltodextrin and feed flow rate. As a conclusion, this study was successfully conducted to choose optimum feed flow rate and concentration of maltodextrin to produce high product yield and good quality of powder.

CHAPTER 1

INTRODUCTION

1.1 Research Background

Pineapple is a tropical plant and grows best in a moderately warm climate between 16°C to 33°C with low but regular rainfall (Collin, 2009). Its scientific name knows as Ananas Comosus (L.) and included in the family of Bromiliacea. Thailand, Indonesia, Bangladesh and Mexico are the major pineapple producing countries. Mature fruit contains 14% of sugar, a protein digesting enzyme, bromelin and high amount of citric acid, malic acid, vitamin A and B. It also contains considerable amount of calcium, potassium, vitamin C, carbohydrates, crude fibre, water and different minerals that is good for the digestive system and helps in maintaining ideal weight and balanced nutrition (Farid et. al., 2015).

Nowadays, fast technology development has brings a new innovation in the trend of food consumption. Peoples today are well aware of the importance of vitamins. This scenario has increased the global market demand toward the fresh fruit. In order to handle the market demand of the fresh fruit throughout the year, the fresh fruit are preserved using different technique. High moisture content has lead to high water activity which lowering the quality in fruit by increasing the enzyme activity and microbial growth. Thus, drying technique can help to maintain the quality of the pineapple.