UNIVERSITI TEKNOLOGI MARA

CRYSTALLIZATION OF PINEAPPLE SKIN JUICE BY USING SPRAY DRYING TECHNIQUE

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ABSTRACT

Pineapple contains bromelain which known to be natural source of bioactive compound that gives benefits to health purposes. However, high moisture content of the fruit makes it easily perishable and difficult to store and handle. In order to overcome this issue, spray drying technique is implement to convert liquid food products into powder form because the dried powder products will have a longer shelf life at ambient temperature, easy to handle and low cost of transportation. In this research, the juice extracted from the skin of Yan Kee pineapple was spray-dried and the characterization of the resulting powder was determined. The combined crystallization and drying of pineapple skin juice extraction was performed in a pilot-scale spray dryer with a varying parameters of operating conditions. The spray drying process is unique because it includes both particle formation and drying. Optimization of spray drying process was carried out using different inlet temperatures (130-150°C) and maltodextrin concentrations (15-25 % w/w). The effect of different parameters on physicochemical properties such as pH, powder yield, moisture content and bulk density was analyzed. This research demonstrates that the effect of inlet temperature and carrier agent concentration play a vital role in determining the physicochemical properties of fruit extract powder.

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INTRODUCTION

1.1 Introduction

Pineapple have important sources of vitamins and carbohydrates. It is one of the famous Malaysia tropical fruit and the demand is increasing throughout the year. Nowadays, people are educated and well aware with good eating habit for healthy lifestyle thus the trend of the food intake has changed from high calories meal to healthy diet enrichment. This situation make the fresh fruit demand increased in the global market. However, the demand for fresh consumption of fresh fruit like pineapple is quite difficult because pineapple has a high moisture and sugar contents. This has causes the pineapple fruit to have a short shelf life and easily perishable thus the availability of them is limited throughout the year. The preservation of fresh fruit is the method implement to meet the excessive customer's demand through the whole year. The method of drying is used in this preservation to minimize the content of the moisture and water activity in the fresh fruits. By reducing the moisture content and water activity in the fruit, it will leads to decrease in microbial growth and activity thus maintaining the fruit quality.

In this fast economic development years, many techniques of drying were developed and invented such as freeze drying, spray drying, vacuum drying, oven drying and others are used to achieve better product quality in the industries. This study is specifically to transform the fresh pineapple skin juice into dry particulates by using spray drying techniques. Among all the techniques mentioned, spray drying is the most suitable technique used to form powders from fresh pineapple skin juice. By transforming fruit juices into powder form, it is not just another method of drying for easily spoilt fruits, but also it also enhancing the quality of the product development as instant powders or flavoring agents that can be useful in beverages or food products.