UNIVERSITI TEKNOLOGI MARA

ENCAPSULATION OF VITAMIN C FROM PINEAPPLE SKIN USING PRESS TECHNIQUE

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CHAPTER 1

1.1 BACKGROUND STUDY

Pineapple is a tropical fruit that has been one of the fresh foods that mostly exported and have a lot of demands because of its excellent flavor and taste. Thailand, Philippines, Mexico, Costa Rica and Brazil are some of the major pineapple producing countries. It is a favorite for the lovers of fruits in its fresh form. The fresh pineapple juice is a popular product because aroma favorable, sense, and many functional nature (Rattanathanalerk et al, 2005). In the past, notwithstanding fresh fruit, Americans locals use pineapple, for fiber production and for medical purposes, as an emmanagogue, antiamoebic and for the stomach upset rectification (Rohrbach et al 2003). The greater part of these restorative and medicinal uses is identified with the proteolytic enzyme bromelain of the pineapple (Coppens d'Eeckenbrugge, 1997).

Apart from that, pineapple processing made the particular fruits famous through developed world that is medium. Some international trade product is canned-fruits, concentrated juice and dry pineapple pieces (Jittanit et al, 2009). Until now, the food industry still doing improvement and keep developing new product from pineapple despite the fact that there are various pineapple based items in the market. In any case, the generally short shelf-life of fresh pineapple fruit has constrained early commercial trade to moderately short transportation or some kind of preservation to keep up the quality of the fruits (Rohrbach et al, 2003). In the context of short-shelf life, the pineapple may have lost its nutrients before being exported. So, instead of export it as fresh fruits, there are other ways to export it without having to worry about losing its nutrient or its short-shelf life.

The benefit of some form of preservation or new product development has eventually assisted in minimizing pineapple loss caused by the microorganisms and chemical reaction. On top of that, while peak harvesting season happens, it can also due to enzymatic reaction. Drying or dehydration is one of the processes to preserve the quality of the pineapple and including the moisture content removal from a food product. It can be transformed into dry particulates or powder utilizing some particular techniques, for example, spray drying, freeze drying and oven drying (Wong et al, 2014).

1.2 PROBLEM STATEMENT

Malaysia is outstanding for its extensive assorted variety of tropical fruits. The high sugar and moisture contents in the particular fruits make them very transient or easily spoil despite the fact the interest for the fresh expenditure of the tropical fruits is expanding. In view of this circumstance, it has bringing about a short time span of usability and constraining their accessibility consistently (APO, 2006). Besides, deficient storage rooms and processing facilities accessible further add to the disintegration and tropical fruits wastage during peak harvesting season (APO, 2006). In this way, processing the excessive fresh fruits into products that profitable and important such as fruit powder, tablet, vitamin C pills, and canned foods has turned out to be progressively well known in recent years. As a result, the product has become beneficial and useful to the target market rather than waste it. The benefit of processing the excessive fresh fruits and developed them is consequently help minimizing the pineapple loss due its short shelf life.

Drying is the process to remove the moisture content from the pineapple to preserve it. Some techniques can be utilized to process it including spray drying and vacuum drying. Spray drying is a one of the techniques that were widely used to replace any liquid into powder shape as the dried powder (Wong et al, 2014). It includes spraying atomization solution droplets that fine into a chamber or space where dry and hot air quickly dissipates the dissolvable and eventually convert into dry particulates or powder (JayaSundera et al, 2010). Pineapple powder is a good quality product because of its long time span of usability and convenience as well as easy to use.

Encapsulation technique is a technology widely used in packaging solids and powdered materials in small capsule and closed that can put out his content under certain circumstances (Risch S. , 1995). In other words, it can enclose the components within a particular protective outer layer while it transforms the liquid feed into a dry, stable form. By this way, pineapple powder can be protected from factors that may cause its deterioration.

1.3 OBJECTIVES

The main objectives of this research are;

1. To make and produce a powdered vitamin C from pineapple skin using the process of encapsulation. Press technique is involved to properly encapsulate the powdered product in sealed capsules.
2. To analyze the optimum temperature at the inlet and maltodextrin concentration to produce highest powdered fruit product yield.

1.4 SCOPE OF RESEARCH

1. Drying or dehydration process of pineapple juice for about 20 minutes for 250ml sample that has been blended or extracted until the moisture content of 10% or below is achieved.
2. The concentration of maltodextrin will be used at 10-30% w/w and mixed with solution.
3. The operating condition for the process in spray drier using different inlet temperature 130-170 °C respectively.
4. The experiment will be carried out using peels of dried pineapples for each extraction which is led for 30 minutes.
5. The encapsulation process for the product involving capsule-binder or tablet to protect the dry particulate and enclose the components properly.