

**UNIVERSITI TEKNOLOGI MARA**

**DRYING AND GRINDING OF PINEAPPLE FRUIT  
FIBRE USING FREEZE DRYING TECHNIQUE**

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## **ABSTRACT**

Malaysia being that a tropical country has favorably provided a suitable environment for various fruits to be cultivated. Such that one of the many fruit would be pineapple. Pineapple in general consisted of moisture and the rest would be the total solids in which of the total solids would be carbohydrates while fibers makes up to the rest. Pineapple fibers are considered to be in the pulp, shell, crown, leaves and the cores. In this paper the fiber of the pineapple core was used as the material because often in time they are being disregarded as waste or feedstock to animals. However, the level of protein in the core is higher than the flesh. Therefore, because of the core has higher protein value, they also have twice the amount of total soluble sugar. Pineapple being a tropical fruit that is rich in nutrient, ascorbic acid, minerals, fibers and antioxidants has make them after banana and citrus the third most traded fruit internationally. As the fruit industry evolves there is a demand for fruits to be consumed in different ways. This demand most likely arises due to the fact that fruits like pineapple has high moisture content and they are deemed as highly perishable product. Therefore, techniques like drying and grinding were introduced and implemented. With this the correlation between the desired to utilize the pineapple waste into a product and the problem face in fruit industries can be solved in this paper. This paper will focuses on the drying and grinding of the pineapple fruit fiber using freeze drying technique and a simple analysis on the taste, stickiness, scent, color and size of the product were provided.

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## TABLE OF CONTENT

<b>CONFIRMATION BY PANEL OF EXAMINERS.....</b>	<b>ii</b>
<b>AUTHOR’S DECLARATION .....</b>	<b>iii</b>
<b>SUPERVISOR’S CERTIFICATION.....</b>	<b>iv</b>
<b>ABSTRACT .....</b>	<b>vi</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>vii</b>
<b>TABLE OF CONTENT.....</b>	<b>viii</b>
<b>LIST OF TABLE .....</b>	<b>x</b>
<b>LIST OF FIGURE .....</b>	<b>xi</b>

<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>12</b>
1.1.1. Research Background.....	12
1.1.2. Objectives.....	13
1.1.3. Scope of Study .....	13
1.1.4. Problem Statements.....	14
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>15</b>
2.1.1. Pineapple Fruit .....	15
2.1.2. History and Introduction .....	15
2.1.3. Nutritional Value.....	16
2.1.4. Uses of Pineapple.....	17
2.2.1. Pineapple Fruit Fibre .....	18
2.2.2. Introduction.....	18
2.2.3. Uses.....	19
2.3.1. Freeze drying .....	20
2.3.2. Introduction.....	20

# CHAPTER ONE

## INTRODUCTION

### 1.1.1. Research Background

Malaysia being that a tropical country has favourably provided a suitable environment for various fruits to be cultivated. Such that one of the many fruit would be *Ananas Comosus*, the scientific name of what was commonly known as pineapple, a tropical fruit that is rich in nutrient, ascorbic acid, minerals, fibres and antioxidants. As of today similar to any general fruit, pineapple is preferably to be consumed fresh or processed as juice or canned. After all, pineapple after banana and citrus is the third most traded fruit internationally. That being said, the market for pineapple based product is one of the fastest growing in the world (Lobo et al., 2017). Claim like this can only be made as pineapple is proven to be a versatile fruit, such that the usage ranges from being animal feedstock to medicine. Not only the flesh but the core, peels and the crown of the pineapple are proven to be of used.

As the food industry evolves undeniably there is a demand for fruits and vegetables to be consumed in different ways. Most likely these demands arises due to the fact that 80 % of fruits and vegetables are consisted of water therefore they are deemed as highly perishable(Changrue et al., 2006). To keep the fruits and vegetables to stay fresh as long as possible furthermore to retain it in its original form is not an easy task due to most storage technique required a very low temperature which would be difficult to execute throughout the distribution chain. From here, countless new technique was develop and among them was the drying and grinding technique. However both of these technique was not recently discovered in fact it was first recorded in the 18<sup>th</sup> century (Vega-Mercado et al., 2001) where the most basic and simple technique was applied, with the sun used in the drying process and mortar and pestle in the grinding process. Nevertheless due to the poor quality and the contamination of the products this then leads to the emergence of new drying and grinding technologies (Sagar et al., 2010).