

# CHAPTER I

## INTRODUCTION

### 1.1 Background of Study

Nata de pinari is an innovation from Nata de coco that was found in 1949 by a Filipino scientist that working for the National Coconut Corporation (Dian Sudiantini, 2022). This fermented food that made from coconut water is known by the name “nata de coco” derived from Spanish which means “cream of coconut”.

Nata de coco is a tender, translucent white jelly-like food consisting cellulose compound (dietary fiber) which is the result of fermenting coconut water with bacterial cellulose called *Acetobacter xylinum*, known as nata seeds (Lestari in Dian Sudiantini, 2022). This product is a nutritious food, rich in fiber yet less in calorie, it makes Nata de coco provides various benefits for health such as managing weight (minimizing the chance of obesity) and reducing cholesterol. Nata de coco is very popular and accepted in various circles and countries. The market of Nata de coco is wide, it is retailed in domestic market and global market such as the United States, Japan, Europe, and Middle Eastern countries (Dian Sudiantini, 2022). The heavy demand of Nata de coco rise when the holiday season begins, for instance when Ramadan, people often use nata de coco to make takjil for breaking the fast.

Nata de pinari is made to make a new variant of Nata de coco using rice washing water, pineapple skin juice and pineapple flesh juice. Besides making a new variant of Nata de coco, the author want to take the advantage and reduce food waste. The reason why the author cares about food waste is because the second largest producer of food waste in the world is Indonesia with a total of 1.3 million tonnes per year (Annisa Nurul Kariymah, 2020). The negative

impact on various aspect including the impact on the environment from food waste is huge and detrimental, for instance from the environmental side the negative impact cause an environmental degradation, food waste can increase global warming due to the release of methane from decomposed food waste (A.Hasanah, 2022 ; Jessica Clarensia Suko, 2022). The cause of the high number of food waste in Indonesia is because Indonesia is a country that has a large population and has a high birth rate which increase every single year. Many Indonesian people are still not aware of the detrimental impact caused by food waste, by providing interesting education or creating campaigns on several social media platforms such as Instagram about food waste which can be utilized and reprocessed into useful products can help to save the environment and reduce the amount of food waste.

The difference between Nata de coco and Nata de pinari is that Nata de pinari does not contain coconut water, the author utilizes rice washing water, pineapple skin juice and pineapple flesh juice as substrate for the formation of cellulose layers because these ingredients are rich in vitamins, minerals and carbohydrates as a carbon source.

Rice washing water is the first main ingredients to make Nata de pinari. Rice washing water is liquid waste obtained from the process of washing rice before cooking which is often found in Indonesia. According to (Rachmat in Maryam, 2021), rice washing water contains several chemical elements such as Protein, Carbohydrates, Vitamin B<sub>1</sub> or Thiamine that mostly found in the pericarp and aleurone that eroded through the rice washing process. It has been proven by (Fitriah in Maryam, 2021) that nutrient content such as carbohydrates and several types of substances produced by rice washing water waste can be used as a substrate for the growth of nata seeds which produce layers of extracellular polysaccharides (cellulose). In Indonesia, the utilization of rice washing water is still quite uncommon, usually it just thrown away directly. However, in some agricultural sectors, rice washing water has been utilized as plant fertilizer and for watering plants since it can accelerate plant

growth and boost agricultural production. Nevertheless, it is still rarely utilized for processing food product.

Furthermore, pineapple skin juice and pineapple flesh juice is the second main ingredients to produce Nata de pinari. Pineapple is a fruit that is very common found in Indonesia because the tropical climate in Indonesia supports the growth of pineapples. Pineapple is very popular among Indonesians, because the combination of sweet and sour tastes, has a soft texture and contains a lot of water makes pineapple feel very refreshing. In Indonesia, pineapples are often consumed directly or processed into beverages, snacks, desserts, jams and also as traditional medicine. The total production of one of the leading fruit commodities in Indonesia, namely pineapple, in 2020 reached around 2.08 million tonnes (Harahap et al., 2019).

Besides its well-known beneficial fruit content, which is rich in nutrients and highly beneficial for the human body, it turns out that pineapple skin also has numerous health benefits. One of the benefits of consuming pineapple skin is to protect the body from chronic diseases, because pineapple skin is rich in antioxidants (Reiza et al., 2019). The part of the pineapple that is usually consumed is only the fruit and according to (Rulianah in Tri Nur Chasanah, 2021), only 53% of the pineapple is consumed, and the rest, such as the core and skin of the pineapple, is thrown away as waste because the taste and texture of the core and the skin is bland and hard. As time goes by, the waste from pineapple will increase and it can pollute the environment. Pineapple skin is a waste that is produced every day by fruit shops and fruit merchants in the market because consumers prefer to buy pineapples that have been peeled clean to make it more practical and ultimately cause accumulation of pineapple skin waste. Therefore, the author wants to take advantage of the pineapple skin waste and process it into nutritious food products. In addition, the utilization of pineapple waste is an effort to increase the economic value of unused part of the pineapple.

The process of making Nata de pinari requires a fermentation method. Gram-negative bacteria known as *Acetobacter xylinum* may produce cellulose from glucose, which results in the formation of a transparent to milky white layer that floats on the media's surface, a cellulose synthesis activity catalyzed by a cellulose-synthesizing enzyme bound to the bacterial cell membrane occurs when producing nata using the bacterium *Acetobacter xylinum* (Tri Nur Chasanah, 2021). A British scientist named Andrian Brown first discovered that the resting cells of *Acetobacter xylinum* produce cellulose if the right amounts of oxygen and glucose are present in 1886 (Rabiu Salihu, 2021).

## **1.2 The Objectives of The Study**

1. Lift up values of rice washing water and pineapple skin
2. Inventing a new innovation of nata de coco
3. Reducing food waste by turning food waste into valuable and nutritious product
4. Educating people that rice washing water and pineapple skin contain a lot of nutrients and these food waste can be used to produce food product
5. The invention of this product mainly aims to be a source of knowledge for the people that the production of nata de coco using coconut water can be substitute with other ingredients, namely by using rice washing water, pineapple skin and pineapple flesh juice