

CHAPTER I

Introduction

1.1 Background of The Study

1.1.1 Background of The Ingredients

The main ingredient used is watermelon rind. The overflowing amount of watermelon rind as waste especially after a harvest season is almost always being thrown out all this time. There are still lots of people who don't know about the benefits in watermelon rind. The rind of watermelon has high water content and potassium that can help in neutralizing blood pressure. It also contains antioxidant including beta-carotene, vitamin C, and phenolic help in keeping the body's cell stay healthy, also being functioned as functional food and nutraceutical by the food industry (Sugeha A. et al. 2015; Mushtaq et al. 2015). Some of the potential of watermelon rind are to help in treating dysentery, tumor, heart disease, gastric acid problem, and liver disease (Bellary et al. 2015).

The rind of watermelon is also a source of pectin, just like the soft tissues in other plants, watermelon rind is composed of 21.03% pectin (Sutrisna, 1998). Pectin or coagulant has an important role in affecting food's texture and in the end will affect the consumers's choice of food. According to Hawley (1981) pectin is an important additional component in food, cosmetic, and pharmaceutical industry because of its ability to change the functional trait in food products such as consistency, emulsion, and gel. One of processed food products that need coagulant or gelling agent in the form of pectin is jam. According to Yenrina et al. (2009), jam is categorized as processed food product

that comes from fruits. Fruit jam is liked by lots of people from many different groups, so making jam in food industry is a good prospect to be developed. The fact that watermelon rind has quite a lot amount of pectin is a plus point in making jam.

1.1.2 Reason for Ingredient Selection

Watermelon (*Citrullus lanatus*) is a highly cultivated fruit worldwide, having more than 1000 varieties. Watermelon is grown in favorable climates from tropical to temperate regions worldwide for its large edible fruit, which is a berry with a hard rind and no internal divisions, and is botanically called a *pepo*. The sweet, juicy flesh is usually deep red to pink, with many black seeds, although seedless varieties also exist. Watermelon is categorized as a tropical fruit widely consumed by people all around the world including Indonesians. This fruit is especially loved by many Indonesians because of its sweet taste, crunchy flesh texture, and contains lots of water (Prajnanta, 2003). The flesh of watermelon fruit is low in calorie, has high water content around 93.4%, 5.3% carbohydrates, 0.1% fat, 0.2% fiber, and vitamins (A,B, and C). There are many ways this fruit could be consumed, either eaten raw or made into juice and other products.

Watermelon is categorized as a fruit with thick rind, in fact 30% of the total fruit's weight is just the rind. One big watermelon itself has around 1,000-1,200 gr of rind and it is usually being thrown out after the flesh had been consumed. The concern is that much of products are being thrown out rather than being made into something useful. Also, the presence of pectin in watermelon

rind help in the jam making process as pectin is something needed as coagulant in the jam making and by using the watermelon rind as filler in the jam, a significant amount of the ingredients cost can be reduce but same amount of products can be produce.

1.1.3 Nutrients and Health Benefit of Ingredients

Watermelon rind is high in vitamin, mineral, enzyme, and cholophyl. Vitamins contained in the watermelon rind include vitamin A, vitamin B2, vitamin B6, vitamin E, and vitamin C. A quite high amount of vitamin E, vitamin C, and protein in watermelon rind could help in soften the skin and hair, and make hair looks shinier. While betacaroten and lycopene in the rind could be utilized as antioxidant to tighten the skin and prevent wrinkles. The rind also helps in increase imune system and nutritious for the nervous system. Watermelon rind contain amino acid citrulline 2-20 mg/gr dry weight. The citrulline in the watermelon rind serves as antioxidant and can turn into arginine, that is amino acid that has an important role in body's immune system. The nutrition contained in watermelon rind can help maintain the health of the heart. According to We Leung et al. (1970), the chemical components in watermelon rind per 100 grams are as shown below.

Table 1.1.1 The Composition in Watermelon Rind per 100 grams

Components	Unit	Amount
Water	gr	94
Energy	kcal	18
Protein	gr	1.6

Fat	gr	0.1
Carbohydrates	gr	3.2
Fiber	gr	0.6
Calcium	mg	31
Phosphor	mg	11
Iron	mg	0.5
Sodium	mg	1*
Potassium	mg	82*
Manganese	mg	0.038*
Magnesium	mg	10*
Riboflavin	mg	0.03
Thiamine	mg	0.03
Niacin	mg	0.6

(Source: We Leung et al.,1970; *:Rukmana, 1994)

1.1.4 Characteristic of Product

The idea of eating the rind of watermelon fruit might be seen as odd and unappetizing for some people. That's why we have to find some solution to reduce the possibility of people finding it unappetizing. The main problem in making the watermelon rind into edible thing is the smell of the rind. Mixing it with fruit and making it into jam could be one solution to reduce the unpleasant smell of watermelon rind.

In this Research and Development study, strawberry is decided to be used. The reason is that strawberry has quite strong sweet and tangy smell, and it could

help to mask the smell of the rind. Also, strawberry jam is a product that people already familiar with, so it would help in encouraging people to try the watermelon rind product. Using watermelon rind as filler in jam would also help to reduce the cost of the jam making while producing the same amount as usual.

“Rind Jam” is using watermelon rind as filler in jam making. As we can find a way to utilize the watermelon rinds waste to reduce waste buildup and also cutting the cost of ingredients.

1.2 The Objectives of Study

The objectives of the Research and New Product Development study is so Ottimmo’s students can be helpful in creating and developing products that can be useful for society. There could be a lot of reason in using particular ingredients. Health and environment reasons are two from some other factors.

Through this Research and Development study the author wants to create a product made out of watermelon rind waste. It’s still rare to find people making watermelon rind waste into something edible as people might be weirded out with the idea of eating the rind of watermelon. Even though in reality, the rind part of watermelon has a lot of nutrients and benefits for one’s health. Through this study, the author wants to introduce people to watermelon rind product so they will get familiar with it and also by turning the waste into something useful, it might help in reducing waste buildup.

1.3 The Benefits of Study

Through this Research and Development study I explore the health benefits and nutrients in watermelon rind. The fact that something that is usually being thrown away can not only be made into something useful but also healthy is discovered through this study. Through this study also, I want to introduce the idea of processing watermelon rind into edible product to people because in the future there might be more products made out of watermelon rind in the market. The idea might be seen as odd by some people, but to get people familiar with it is the first step. Through reading this report, I hope people can also learn about the benefits and nutrients in watermelon rind so it can be used as reference in making other watermelon rind products.