CHAPTER I

INTRODUCTION

1.1   Background

The trend of eating low glycemic index food is growing nowadays since people are starting to be concerned about health. Food with high glycemic index is proven to be connected with diseases which are caused by high blood glucose level such as diabetes melitus. Rice noodle is a well-known commodity in the Asia region. It has appeared in many variants such as rice vermicelli, *cheong fan*, and broad rice noodle which is also known as *"kwetiau"*. "Kwetiau" is also known as carbohydrate source in which 91.72% of the rice noodle itself is built up from carbohydrate. "Kwetiau" is also currently known to have high resistant starch content which is around 7.94%. One way to know whether a food has low or high glycemic index is to calculate the total amount of resistant starch contained in the food. Studies have proven the connection of resistant starch to glycemic index whereas higher resistant starch results in lower glycemic index. This is due to resistant starch is capable of stimulating the production of insulin which lowers the blood glucose level, which is the component related to glycemic index (Tiboonbun et.al, 2011; Johnston et.al, 2010).

Unripe banana hasn't been utilized much in the production of food. Banana is known as a carbohydrate source. This is due to the high sugar content it has after it ripens. The high sugar content is due to the hydrolysis which happens during the ripening of the banana itself. In its unripe form, banana contain a lot of starch which has not been hydrolyzed into sugar yet. According to Menezes et.al (2011), 56.24%

of the unripe banana which has been processed into flour is constituted of dietary fibers. Most of this fiber is considered as resistant starch. The study upon usage of banana flour as replacer of rice flour in rice noodle making has been done, however, the result shows significant difference between the rice noodle made from pure rice flour and rice noodle made from the unripe banana flour (Tiboonbun et.al, 2011).

On the other hand, taro is rich in small granule starch and gums, which are known to increase the texture of the food using it. Taro also considered to have low glycemic index and is a good source of vitamin C. Furthermore, the usage of taro in food may also work as substance carrier, which result in preservation of flavor. By thus, this study is aimed to find the most suitable ratio between banana flour and taro for the making of analogue rice noodle which result in lower glycemic index and similar sensory evaluation compared to pure rice flour rice noodle (Darkwa and Darkwa, 2013; Sharma et.al, 2016).

1.2 Research Problem

The trend of "kwetiau" having low glycemic index has been known for a long time. By thus, "kwetiau" can be untilized into low glycemic index food which was made by several ingredients which is rarely eaten but having better capabilities than rice flour in producing low glycemic index food. However, studies on analogue rice noodle "kwetiau" development is still lacking.

The research was based on the usage of unripe banana and taro as main ingredient of analogue rice noodle "kwetiau". Unripe banana is known to be rich in resistant starch which may lower the glycemic index while taro is known to increase the textural quality of the product made, thus it can resemble the actual product. The proper procedure method to produce the banana flour must be known to

maintain the high resistant starch content while the ratio of banana flour to taro must also be known to produce "kwetiau" with good properties and high resistant starch value.

1.3 Objectives

1.3.1 General Objectives

The general objective of this study was to utilize unripe banana flour and taro in the making of analogue rice noodle "kwetiau" with high resistant starch content.

1.3.2 Specific Objectives

The specific objectives of this study were:

1. To determine effect of drying time and temperature of each unripe banana (*Musa acuminata* [*Ambon Kuning*] and *Musa x paradisiaca* [*Raja*]) on physicochemical characteristics of unripe banana flour; and to select best treatment for using unripe banana flour as an ingredient in analogue rice noodle.

2. To determine effect of different ratio of unripe banana flour to taro puree on psychochemical and sensory characteristics of each analogue "kwetiau" including resistant starch; and to select best treatments which result in using unripe banana flour and taro puree in making of analogue rice noodle.