# CHAPTER I
# INTRODUCTION

## 1.1 Background

Banana is a food consumed by many people because it is known as a source of nutrition and a source of antioxidants. Banana (*Musa* sp.) is one of the fruit commodities that can be cultivated throughout the tropics, including Indonesia. Utilization of bananas in addition to being consumed directly after ripe bananas, could also be processed into various foods, such as *dodol*, chips, and others (Aryani *et al.,* 2018). Although bananas have many benefits, consumption of bananas will leave organic wastes which are banana peels. Therefore, processing of banana peels is needed to become a more useful product to increase its economic value. A research by Sukriyadi (2010) stated that all the types of banana peels can be processed into flour, but the best flour is found in *Raja* banana peels since it has thicker fiber structure and has a relatively high fiber and calcium content.

Banana peels flour could also be used as a substitute of wheat flour which is known as one of the imported food ingredients that are much needed by Indonesian people. The food fiber contained in banana peels flour as a flour substitute, could provide physiological effects such as cardiovascular disease, constipation, intestinal irritation, colon cancer, and diabetes. Food fiber sourced from fruits has better quality than other fiber sources, due to its high soluble fiber content, as well as phytic acid content and its low calories value (Cho and Samuel, 2009).

Flakes are food products with cereals as raw materials, such as rice, corn, and tubers such as potatoes, cassava, sweet potatoes in the form of thin sheets and

brownish yellow and could be eaten with or without milk (Permana and Putri, 2015). Flakes making could be done by using variations of food ingredients which contain carbohydrate and could also be added to food ingredients that contain other sources of nutrients to meet nutritional needs (Gisca *et al.,* 2013). Rice flakes is one of the most known breakfast cereals used all over the country for years. Rice flakes (100 g) contains energy 361.59 kcal, carbohydrates 71.86 g, protein 7.72 g, and iron 4.74 g (Mathew *et al.,* 2011). As banana peels flour has high carbohydrate content and high fiber content, it has a high potential to be used in flakes making. The high fiber content in banana peels flour is expected to give longer fullness feeling and increase the benefit of consuming flakes as breakfast meal.

In this research, flakes were made by using banana peels to be used as flour because the application of flour made from banana peels was not too expensive in making breakfast meals. Moreover, fiber content in banana peels had the potential to increase nutrient content.

## 1.2 Research Problem

Flakes are ready-to-eat breakfast foods which has a golden-brown color, crisp texture, and low water content. Flakes are consumed by many people since its serving process are practical, instant, and does not need to be cooked. In general, flakes are made from rice flour and wheat flour, which have nutritional content to meet consumers nutritional needs, and to increase the variety of flakes and utilization of banana peel flour. However, flakes on the market nowadays do not contain high fiber content.

While banana peel is one of the available agro-industrial wastes in large quantities at very low price. Banana peel waste gave 30% of the weight of whole raw fruit. Banana peel waste are disposed in an open area and has potential to cause environmental problems. Therefore, utilization of banana peel flour in the making of flakes could reduce banana peel waste and increase the nutritional value of flakes.

## 1.3 Objectives

### 1.3.1 General Objectives

The objective of this research was to utilize *Raja* banana peels flour in the flakes making.

### 1.3.2 Specific Objectives

The specific objectives of this research are:

1. To determine effect of ratio of wheat flour to banana peels flour and steaming process on flakes characteristics, such as sensory, physical, and chemical characteristics.
2. To analyze dietary fiber content in flakes with banana peels flour substitution.