

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Moringa (*Moringa oleifera* Lam.) Plant is one of the medicinal plants which is considered as the world's most useful and beneficial trees as most of the parts of the plant can be utilized for its beneficial contents, from its leaves, flowers, fruits to its bark and roots (Sallau *et al.*, 2012; Bidima, 2019). There are several names used to call the moringa plant which includes drumstick plant and tree of life, etc. However, in Indonesia it is commonly called as "Kelor" (Bidima, 2019).

According to Singh *et al.* (2019), Moringa (*Moringa oleifera* Lam.) Leaves have all nutrient potentials which are required by the human body for healthy living. Several products made from moringa leaves are often produced to treat malnutrition in children, pregnant and nursing women. Previous research conducted by Glover-Amengor *et al.* (2017) stated that moringa leaves could be processed to be used as a food fortificant as it contains high levels of micronutrients which includes iron, copper, manganese, zinc, etc.

Food Fortificant is the sources of micronutrients that are used in food fortification which are generally added to foods as part of premixes as it will constitute the main ingredients in the fortification process. There are several purposes on the use of food fortificant which includes increasing the content of iron and calcium in foods, vitamins, and minerals to increase the nutritional value, increasing the micronutrient supply of a food product and to reduce the nutritional

deficiencies in human body (Dary and Mora, 2013; Spohrer *et al.*, 2013; Ahn *et al.*, 2015).

This thesis is written as a literature review on previous researches conducted over the past 10 years, as it will cover different views and perspectives on the benefits of Moringa (*Moringa oleifera* Lam.) Leaves as a food fortificant in different types of functional foods, also, based on different processing techniques of the Moringa Leaves.

## **1.2 Research Problem**

Micronutrient deficiencies is one of the significant problems in Indonesia (Ernawati *et al.*, 2021). According to Taki (2018), malnutrition is associated with stunting, underweight and overweight. Micronutrients such as vitamins and minerals are needed by humans in a very small amount. However, most of the micronutrient cannot be synthesized by the human body. One of the ways is to obtain micronutrients from other sources through direct consumption of a diet. Commonly the addition of micronutrients is in a form of chemical sources of micronutrients which aims to boost the micronutrient content in a food product (Dary and Mora, 2013).

This shows the need of a food fortificant development from a natural plant-based product to increase and fulfill the micronutrient intake and to prevent malnutrition in Indonesia. Hence, this thesis is written and conducted to explore and provide a broader view of the processing methods used in the preparation of Moringa (*Moringa oleifera* Lam.) leaves as a food fortificant based on all known previous studies and experiments. Moreover, the use of Moringa Leaves as a food

fortificant is not commonly used despite the beneficial micronutrient content. This thesis aims to provide an in-depth overview of the beneficial possibilities to better utilize Moringa Leaves as a food fortificant.

### **1.3 Objectives**

#### **1.3.1 General Objectives**

The general objective of this literature review is to gain understanding and analyze recent progress on the use of Moringa (*Moringa oleifera* Lam.) Leaves as a food fortificant based on several processing methods.

#### **1.3.2 Specific Objectives**

The specific objectives of this research include:

1. To provide review on suitable method used for the processing of Moringa leaves as a food fortificant based on its micronutrient contents.
2. To provide review on suitable method for the reduction of anti-nutritional components in Moringa leaves based on its micronutrient contents.
3. To provide in depth information and analyze the effect of the addition of Moringa leaves as a food fortificant to different types of food products.