

CHAPTER II

LITERATURE REVIEW

2.1 Ingredient Review

2.1.1 Canna Tuber Flour

Ganyong (*Canna edulis Ker*) is a plant native to the Andes Mountains in America. This plant produces tubers commonly known as ganyong tubers, which are underground stems. This plant has been cultivated in several regions in Indonesia such as Central Java, East Java, Yogyakarta, Jambi, Lampung, and West Java (Soenardi and Wulan, 2009). In Indonesia, there are two varieties of ganyong tubers, namely red ganyong tubers and white ganyong tubers. Red ganyong tubers are red or purple in color, while white ganyong tubers are brown (Mutiningsih and Suyanti, 2011). White ganyong is one of the common varieties of ganyong used primarily for starch extraction, due to its neutral taste, smoother texture, and brighter color compared to red canna, white canna (*Canna edulis*) is preferred for making flour. Additionally, white canna is more readily available than red canna. While red ganyong is consumed by cooking and boiling (Center for Agricultural Biotechnology and Genetic Resources Research and Development, 2010).



Figure 2.1 Canna

In Indonesia, the community utilizes ganyong by boiling it and making crackers. Additionally, mature ganyong tubers are used as a source of starch by the community, while young tubers are used as vegetables or steamed, and the shoot parts are used as animal feed (Center for Agricultural Biotechnology and Genetic Resources Research and Development, 2010). The nutritional differences between white and red ganyong flour are minimal. For example, white ganyong flour contains slightly less fat than the red variety, but the difference is less than 1 gram. Similarly, red ganyong flour has a higher protein content than the white one, but again, the difference is less than 1 gram. Therefore, there is no significant difference in terms of nutrition. However, there has also been the utilization of ganyong flour (*Canna edulis Ker*) as a substitute for wheat flour in the production of high-energy protein biscuits with the addition of red bean flour (*Phaseolus vulgaris L*) (Riskiani et al., 2014). Ganyong can also be used as an edible coating for storing apples with a concentration of 1% (Anggarini et al., 2016).

2.1.2 Mung Bean Flour

Mung beans (*Vigna radiata L.*) are one of the legume crop commodities widely consumed by the Indonesian people, such as in green bean porridge and stuffed onde-onde. Its sprouts are known as bean sprouts. This plant contains various nutrients, including starch, protein, iron, sulfur, calcium, fatty oils, manganese, magnesium, niacin, and vitamins (B1, A, and E). Another benefit of this plant is its ability to aid in bowel movements and boost vitality, as well as being used for medicinal purposes (Atman, 2007). Mung beans are a type of cultivated legume plant widely known in tropical regions. Plants belonging to the legume family (*Fabaceae*) have many benefits in daily life as a source of high-protein plant-based food.



Figure 2.2 Mung Bean

The use of mung beans as a substitution ingredient is usually in the form of flour. Mung bean flour is a semi-finished product that can be utilized to create various processed foods. In 100 grams of mung bean flour, it contains approximately 286 kilocalories of carbohydrates, 31.5 grams of protein, 14.3 grams of fat, 35.1 grams of fiber, and a water content of 175 milligrams (Nurcahyani, 2016). The use of mung bean flour in food processing can result in a variety of processed foods and

reduce the use of wheat flour. Indeed, the use of mung bean flour can also reduce the level of wheat flour usage in bread making.

2.2 Product Review

The aim of this product is to produce egg roll products using green bean flour and canna flour. Green bean flour is selected due to its lack of gluten, high protein content, and potential health benefits such as cancer prevention, blood sugar regulation, and increased endurance due to its vitamin A content. Additionally, Canna tuber flour has high protein, vitamin C, calcium, and iron content. Despite being underutilized, canna flour serves as a gluten-free alternative to wheat flour. Thus, the egg rolls are gluten-free.

The advantage of this product lies in its transformation of traditional wheat flour-based egg rolls into gluten-free ones by substituting canna tuber flour and mung bean flour. The resulting texture remains crunchy, while the taste highlights the deliciousness of mung beans. Moreover, mung bean egg rolls offer more health benefits compared to conventional ones.

2.3 Process Review

Egg roll is a snack in the form of egg cookies that are rolled into shapes, either straight rolls like tubes or flat, cone-shaped rolls (Khongguan Group, 2013). The process of making egg rolls involves mixing the dough, then molding it in a preheated mold. Once the egg roll is cooked, it is rolled. The egg roll mold is usually round and thin. This mold is used on a stove. After pouring the batter into the mold, we close the top side of the mold, which presses the batter and makes it thin and crispy.