

CHAPTER II

LITERATURE REVIEW

2.1 Ingredient

2.1.1 Carob

Carob (*Ceratonia siliqua L.*) is a typical Mediterranean tree species introduced to the temperate regions of Central America, Australia, and Africa. Carob pods have a nutritional value of a high level of carbohydrate (67.48%), appreciable amounts of protein (6.64%) and low level of fat (2.24%), and dietary fibers (~ 11%). Also, carob is a rich source of minerals (Mg, Fe, P, Zn, Ca, K, Na) and significant amounts of phenolic compounds (gallic acid, tannins) and vitamins (D, E, C, B6, folic acid). The carob fruit, also called carob pod, generally consists of the pulp/ endosperm (80–90%) and the germ/ seed (10–20%) by weight, each one of which is used in a great variety of bakery products and as food additives and dietetic products .Carob powder can be produced from carob fruits after discharge of the seeds, followed by roasting at 120 and 180°C (typically, 150°C) for 10–60 min to obtain several degrees of roasting (low, medium, and high roast) (Mahgoub, 2022)

The roasted carob powder is sweeter, has a dense caramel-like taste, has an extra cacao-like aroma at low-roasting temperatures. However, it has a more astringent taste, coffee-like flavor, and roasted aroma at a high roasting temperature. Besides, its low glycemic index food and low glycemic load make it a cocoa alternative and natural sweetener in bakery products, particularly cocoa-containing cake recipes and dietetic food (Hafez, 2022).



Figure 2.1 Carob

2.1.2 Wheat flour

Wheat (*Triticum aestivum* L.) is one of the world's staple crops. In 2014, the total global output of wheat was approximately 850 Mt . Maintaining consistency in wheat flour quality is necessary to meet the demands of a growing population for more high-quality wheat. Wheat quality is determined by gluten strength and is affected by the proteins in wheat flour. Total protein content and protein components determine flour processing quality and the commercial value of flour products. Genes, environmental factors, and cultivation methods control the content of protein and its components in wheat grain. During the grain filling stage, High Temperature Stress (HTS) can not only reduce grain yield, but also affect flour protein components and its functional properties, and in turn, worsen the rheological properties and baking quality of the flour. Nuttall et al. reported that owing to climate change, the daily frequency of extreme high temperatures is increasing; hence, the frequency of HTS occurring in the late growth stages of wheat will increase and will reduce the yield and quality of wheat (Ma S, Yang Y, 2018).

2.1.3 Coconut

Coconut (*Cocos nucifera L.*) has been widely grown in Southeastern Asian countries for centuries. These countries are the world's main exporters of coconut meat containing products of various types, such as coconut milk, coconut chips, desiccated coconut, and virgin coconut oil. (Office of Agricultural Economics Ministry of Agriculture and Cooperatives, 2016). Recently, coconut products have become a fast-growing exported food of Thailand (SME Thailand NEWS, 2017).

Due to rapid economic development in the region, plants of higher economic values have drastically replaced coconut farming areas in the region. On the contrary, a stronger demand for coconut products has risen significantly as more and more claims about the health benefits of these products are being made worldwide, especially for coconut milk and virgin coconut oil (Ngampeerapong,2019)

The advent of stronger demand, improper agricultural zoning policies, drought, flooding as well as plant diseases led to a shortage in domestic coconut supplies, which became a serious problem for countries in the region and led to exchange of coconuts among their neighboring countries. The raw materials from different growing areas can have different qualities, which directly effect on the quality and efficacy of the coconut-meat containing products. In responding to the coconut regional trade concern, the objective of this study was to evaluate the differences in certain chemical characteristics of the commercially used coconut meats from 3 different geographical sources, which can influence qualities of the subsequent coconut meat containing products being available in the market (Chavasit,2019).

2.2 Ravioli

In English, pasta is a term for various types of dishes with the main ingredient being one type of pasta seasoned with sauce. Pasta comes from

the Italian "pasta alimentare" which means food dough. In a broad sense, "pasta" can mean all dough, such as bread, pastry or cake dough. Pasta is classified based on the similarity in shape and variety. Pasta has 6 types of categories based on its shape, namely: Corta pasta, short shapes such as penne and rigatoni. Long pasta, such as spaghetti and fettucini. Pastaripiena, namely pasta that has stuffing in it like, ravioli. Pastina, which is small pasta usually cooked in broth or soup. These pasta shapes vary, such as stars, letters or numbers. Gnocchi/gnocchetti, small pasta shaped like balls or pillows. Strascinati, traditional pasta printed with wooden moulds. Ravioli is a type of pasta consisting of two sheets of pasta with fillings such as meat, mushrooms and vegetables in various shapes. This dish is familiar and quite popular overseas, but in Indonesia this dish is still rare, even though ravioli is only available in F&B restaurants with quite high prices (Rahmadhaania, Suci, 2021).

2.3 Baking

Baking is a form of cooking performed in an oven. It transforms semi-solid dough into an eatable product under the influence of heat (Divyasree Arepally, 2020). The processes responsible for developing browning in bakery product are 1) Maillard reaction (chemical reaction between amino acids (proteins) and reducing sugars), 2) caramelization (the process of heating sugars, such as sucrose) and 3) dextrinization (process of breaking down complex carbohydrates). These reactions develop the desired appearance or colour, flavour, texture, and taste that are important in bakery products. (Nguyen, Peters, & Van Boekel, 2018)

