CHAPTER II
LITERATURE REVIEW

2.1 Ingredient Review

2.1.1 Chicken Fillet *(iStock)*

Figure 2.1 Chicken Fillet

Chicken fillets are a type of chicken cut that is typically taken from the bird's breast or thigh region. They are boneless slices of meat that are mostly flat and not always the same thickness throughout the length of the flesh. Chicken fillets have several applications, owing to their versatility as a cut of bird that can be served whole or chopped into smaller pieces for use in other dishes. Chicken meat has high in protein and includes amino acids that the human body need. Aside from protein, chicken meat contains fat, carbs, vitamins, particularly vitamin B complex components, minerals, and water. Each component differs according on the chicken's species, age, and sex. Aside from its nutritional content, chicken meat has other advantages, including the fact that it is relatively inexpensive, can be consumed by people of all socioeconomic levels, and is widely available in the market. One of the advantages of utilizing chicken fillets in cooking is that they cook rapidly. Heat flows fast through the meat, allowing it to cook interior before the surface burns, which is useful when breading the meat. This makes chopped chicken fillets, particularly those made of thigh meat, ideal for stir-frying. Using chicken as one of the primary ingredients for meatballs since it is less expensive than other

meats such as beef, fish, etc. Aside from being inexpensive, chicken flesh has a smooth and sensitive texture and is safe for everyone to ingest. Chicken provides more protein and less calories than beef. According to Directorate of Nutrition, Ministry of Health (2010) chicken meat contains protein of 18.20 grams, fat of 25 grams, and has calories of 404 Kcal per 100 grams of chicken meat. Chicken meat is a source of protein high-quality animal products, containing complete essential amino acids and high unsaturated fatty acids (Muchtadi and Sugiyono, 1992; Yuli 2018).

2.1.2 Jackfruit Seed

Figure 2.2 Jackfruit Seed

Jackfruit, as known by its scientific name (*Artocarpus heterophyllus*), is one of Malaysia's most popular tropical fruits. It is known as 'Nangka,' and it is frequently confused with cempedak (Artocarpus integer), which belongs to the same genus and family as jackfruit and breadfruit. Although cempedak is more popular in Malaysia due to its sweetness, jackfruit is easily available all year and is viewed as a good alternative replacement for starch flour. It is frequently grown in warm, moist climates, particularly in Southeast Asia. Jackfruit is a plant that is widely grown in Indonesia for a variety of reasons, one of which is its widespread popularity. Based on Horticultural Production Statistics data (2015), jackfruit production in Indonesia reached 11.57 tons per hectare with a harvested area of 55.693 hectares in 2014. Jackfruit fruit has an average of one third of the fruit's weight in seeds. Jackfruit seed

have a round shape, but some are oval in shape, in two pieces, the number of seeds per fruit ranges from 150-350 seeds. The jackfruit seed has three layers of skin, namely the yellow outer skin which is slightly soft, the brown epidermis which covers the flesh and the white clay skin (Sari, 2012; M. Ridwan, 2020). Jackfruit is divided into two parts: edible (pulp and seed) and inedible (rind and rachis). The tender green fruit is typically consumed as a vegetable, and the rich flesh of the ripe fruit is consumed fresh as a dessert. Before eating, the seed of the fruit is frequently prepared by roasting, boiling, frying, or even steaming. The jackfruit is the world's largest edible fruit. A ripe fruit can weigh between 2 and 36 kg and have a length of up to 90 cm. A single fruit typically contains 100-500 seeds, accounting for 8-15% of the total fruit weight. The seeds are approximately 2-4 cm long and 1-2 cm in diameter. Jackfruit seed is an ingredient that is often not used and thrown away after consuming the fruit. So far, jackfruit seeds have been used as jackfruit seeds or animal feed. Jackfruit seeds are underutilized and less acknowledged by people, but they have considerable nutritional benefits and constitute about 10% to 15% of the fruit weight (Hossain, 2014, Hasnita, 2021). Even though young jackfruit has a significant potential for usage in a range of processed meals. In processed meat products, the starch from jackfruit seeds can operate as a filler and binder, particularly for meat products processed with restructured meat technology. Jackfruit seed is a by-product of jackfruit fruit so it has never received special attention in its use. Jackfruit seeds have a fairly high nutritional content, namely 36.7 grams of carbohydrates, 4.2 grams of proteins, 165 Kcal energy, and contain minerals in the form org 200 mg phosphorus, 33 mg calcium, and 1.0 mg iron, so they have great potential in making flour (Santoso dkk, 2014; Tasya 2020). The role of calcium and phosphorus in the human body of which is for formation of bones and teeth (Winarno, 2004; Hasnita, 2021). One of the efforts to improve the quality and economic value of jackfruit seeds is to process them into jackfruit seed flour. Thus, jackfruit seed flour

can be used as a substitute for wheat flour in the processing of food products. Processing of flour is an alternative way of semi-finished products because it is easy to form, has a longer shelf life, is rich in nutrients, and is practical (Sari, 2012; M. Ridwan 2020). Utilization of jackfruit seeds into flour is a semi-finished product processing, as well as an effort to extend the product shelf life of the harvest so that it can be profitable, for example safe in distribution, saving space and storage costs. Jackfruit seed flour can be used as an alternative ingredient to replace flour or flour substitutes. The nutritional value of calcium and phosphorus in jackfruit is higher than wheat so that it can help increase the consumption of various nutrients for the community (Susanto, 2013; Halimah 2021). Jackfruit seeds contain good carbohydrates and calories when consumed by humans, so there are various form of business so that they can be utilized (Restu et al, 2015; M. Ridwan 2020). Jackfruit seed flour contains nutritional components including 12.40% water, 3.24% ash, 12.19% protein, 1.12% fat, 71.05% carbohydrates, and 2.74% crude fiber (Republic of Indonesia's Ministry of Industry, 2012, Tasya 2020). Making jackfruit seed flour is also an effort to store jackfruit seeds so they last longer because jackfruit is a seasonal fruit that bears a lot of fruit in August-November, in other months it is hard to find (Suprapti, 2004; Dayu, 2018).

Jackfruit seed starch is predicted to replace tapioca flour as a filler and binder in meatballs. The study of meatball substitution with jackfruit seed starch aims to diversify food sources and utilize jackfruit seed waste from jackfruit processing waste.

2.2. Product Review

2.2.1 Chicken Meatball

Chicken meatballs were one of the processed foods that people liked since they tasted delicious and were healthful. Chicken meatballs have a softer texture than beef meatballs. broiler meat is widely used as meatball

because of its tenderness and softness (Montolalu et al, 2013; Fitrianingsih, 2020). Tenderness, in addition to flavor, is a signal for consumer evaluation. Customers like meatballs that are more soft and simpler to chew. meatballs of consumers' choice had tenderness scale between 10.02 to 10.04 mg-1s-1 (Sunarlim, 1997; Fitrianingsih, 2020). Meat is often processed to increase economic value, shelf life and public consumption tastes through a variety of products such as beef jerky, shredded meat, sausages, meatballs. Meatballs can improve community nutrition (Nafly et al, 2011, Fitrianingsih, 2020).

Meatball is a meat emulsion product to which finely ground meat, flour, and spices are combined. Meatballs are food with a meat content of not less than 50% and starch or cereals (BSN, 1995; Farida 2018). In terms of nutritional aspects, meatballs are foods that contain high levels of animal protein, minerals and vitamin (Yuyun, 2008; Dayu Dewi, 2018). The nutritional value in meatballs makes it easy for buyers to choose meatballs that suit their tastes (Hermanianto and Andayani, 2002; Hari, 2018). Meatballs are typically shaped into circles that resemble little balls. Meatballs have a great flavor and a chewy texture that appeals to both youngsters and adults. Meatballs are typically processed to be used in recipes like meatball soup, grilled meatballs, stir-fry meatballs, and other meatball dishes. Meatballs sold at markets and supermarkets are produced from a variety of meats, including beef, chicken, and fish recipes like meatball soup, grilled meatballs, stir-fry meatballs, and other meatball dishes. Meatballs sold at markets and supermarkets are produced from a variety of meats, including beef, chicken, and fish.

2.3 Process Review

2.3.1 Drying

Drying is a very important process in the manufacture of flour, because flour is a food ingredient that has a lower water content when compared to the basic ingredients. Improper drying process will result in

damaged nutritional components contained in the food. According to Walstra et al (1999), the drying process is intended to eliminate or reduce unwanted biological activity, such as enzyme and microbial activity. However, during the drying process damage to nutrients and factors that determine the quality of food ingredients also occur. The drying process to become jackfruit seed flour, is done by leaving food in the sun, known as drying naturally. This drying process aims to reduce water content in the jackfruit seeds.

2.3.2 Boiling

Boiling is a moist-heat cooking method that occurs when the temperature of the liquid hits 212 degrees. For equal heat dispersion, the food is entirely submerged in water. The full boil is a forceful one, with bubbles breaking over the entire surface of the water. At 205 degrees, a slow boil is a lethargic boil, almost a simmer. Bubbles will slowly break over the surface of the water in the case of a slow boil. Depending on the meal, you must either add it to already boiling water or add it to cold water and bring it to a boil; more on that later, down below. Boiling improves the texture of starchy meals and harder proteins, making them more palatable. It also softens and tenderizes grains, dry pasta, and dried beans. Looking at the surface of the liquid is the best way to check if your food is boiling. Are there large bubbles bursting on the surface? If not, it is necessary to increase the heat or cover your pot. A thermometer can also be used to monitor the temperature of the water and to determine the internal temperature of what you are cooking, especially for meat and poultry. Although boiled meatballs lack the browned, crispy outside of fried or baked meatballs, they do have the advantage of being simple to make and quick to prepare. Boiling meatballs preserves them moist and tasty while also being a healthy way to prepare them. Season the water before boiling to add taste. Follow these steps to make your first batch of delectable boiled meatballs. At 100^0C, water reaches a rolling boil (visible bubbling and steaming). Raw meatballs take five to ten minutes in boiling

water, depending on size, but frozen meatballs take 15 to 20 minutes, depending on size. Boil all meatballs until the internal temperature reaches 71^0C. Bring a pot of water to a boil large enough to hold all of the meatballs comfortably. Before bringing the water to a boil, add any dried spices, herbs, seasonings, or other liquids. Place the meatballs carefully in the water and cover the saucepan, allowing them to simmer until thoroughly cooked with an internal temperature of 71^0C. While a quick-read thermometer is the most accurate way to determine doneness, cooked meatballs are gray-brown in color and firm and bouncy when touched. Using a slotted spoon, remove the meatballs from the pot.