CHAPTER II

LITERATURE REVIEW

2.1 Ingredients

The main ingredients that will be used in this gyoza is cassava flour replacing the original wheat flour and as the main protein this gyoza utilize duck instead of the traditionally pork gyoza, so people that have food restriction may still enjoy this dish this particular meat is chosen as a food alternative due to its rich flavour from its fattier nature.

2.1.1 Duck

Duck meat has higher muscle fibre content in breast meat compared to chicken and is considered as red meat. Moreover, due to a higher fat content (13.8%) than chicken and a stronger gamey flavour, duck meat can be less appreciated by the consumer. Duck meat is a good source of polyunsaturated fatty acids, particularly those made up of 20 and 22 carbon atoms (Subhasish Biswas et al., 2019).

Duck meat is richer in phospholipids that are precursors of aromas after cooking, and it has then a flavour considered more pronounced than that of chicken meat. The protein content of mule duck fillet is 22.4%. the collagen content of the duck meat between 8 and 12 weeks of age varies between 8.7 and 7.3 mg/g Duck meat is fatter (1.5–2% in the fillet depending on the species Within lipids the most variable fraction is that of triglycerides, the amount of which is positively correlated with that of the lipid content: 0.7% in the fillet and 3% in the thigh of chicken while 0.5–0.8% in the duck fillet. Phospholipid content is 0.6% in the fillet and 0.8% in the thigh of chicken In duck fillet, this content is 1.1% . The

cholesterol content is 0.05% in the fillet and 0.09% in the thigh of chicken while It's comprised between 0.07 and 0.12% in the duck fillet. (E. Baeza, 2022)

2.1.2 Cassava

Cassava (*Manihotesculenta Crantz*), native to Latin America, is increasingly grown in tropical and subtropical areas. It is the main source of calories in the tropics and income for small-scale farmers. As has been Asian farmers are known by rice and European farmers are by wheat as well as potatoes African farmers are known by cassava. Cassava (manioc or yucca, with various spellings) is drought tolerant and its mature roots can maintain their nutritional value for a long time without water and thus, it may represent the future of food security in some developing countries. These days, tropical and subtropical countries of Africa, Asia, and Latin America. for its calorific value of 250×103 cal/ ha/day as compared to 176×103 for rice, 110×103 for wheat, 200×103 for maize, and 114×103 for sorghum. The root is a physiological energy reserve with high carbohydrate content, which ranges from 32% to 35% on a FW basis. Cassava roots have high calcium, iron, potassium, magnesium, copper, zinc, and manganese contents comparable to those of many legumes, with the exception of soybeans. The calcium content is relatively high compared to that of other staple crops and ranges between 15 and 35 mg/100 g edible portion (Adugna Bayata, 2019).

2.2 Product Review

2.2.1 Gyoza

there are three types of Gyoza on the market: Yaki Gyoza, which is gyoza that is panfried (cooked by roasting with sesame oil), Sui Gyoza, which is gyoza that is prepared by boiling or steaming (steaming), and Age Gyoza, which is gyoza that is deep-fried to generate a crispy texture. Gyoza can be made more interesting by swapping or replacing the filling with locally sourced or rarely used items with great nutritional value. ((Natanael et al., 2021). the issue of this product is not everyone may not be able to enjoy the dish because the dish is traditionally made using pork which some of people may not be able to consume.

Gyoza is made up of two parts: a wheat flour skin and a filling made up of chopped cabbage, onions, and pork. The gyoza skin is created by mixing flour with hot water and forming circular sheets, while the gyoza filling is made by stirring minced beef, chopped cabbage, scallions, and liquid seasoning until well combined.

Figure 2. 1 Gyoza

2.2.2 Gluten-free

Gluten is a group of proteins found in wheat, barley, rye, and their derivatives. It provides elasticity and structure to dough, which helps bread and other baked goods rise and maintain their shape. Gluten is responsible for the chewy texture in many bread products. However, it can be problematic for individuals with gluten-related disorders, such as celiac disease, wheat allergy, or non-celiac gluten sensitivity, as their bodies react negatively to the ingestion of gluten. For these individuals, consuming gluten-containing foods can lead to a range of health issues, from digestive problems to more serious autoimmune responses in the case of celiac disease. As a result, gluten-free diets have become essential for those with gluten-related disorders, and a wide variety of gluten-free products are now available to cater to their dietary needs.Celiac disease (CD) and non-celiac gluten/wheat sensitivity (NCG/WS) are the two most frequent conditions belonging to gluten-related disorders (GRDs). Both these diseases are triggered and worsened by gluten proteins ingestion, although other components, such as amylase/trypsin inhibitors (ATI) and fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAPs), seem to be involved in the NCG/WS onset. Therefore, the only effective treatment to date is the long-life adherence to a strictly gluten-free diet. Recently, increasing attention has been paid to the intestinal barrier, a dynamic system comprising various components, which regulate the delicate crosstalk between metabolic, motor, neuroendocrine and immunological functions. Among the elements characterizing the intestinal barrier, the microbiota plays a key role, modulating the gut integrity maintenance, the immune response and the inflammation process, linked to the CD and NCG/WS outbreak. This narrative review addresses the most recent findings on the gut microbiota

modulation induced by the gluten-free diet (GFD) in healthy, CD and NCG/WS patients. (Giacomo Caio et al., 2020)

2.3 Steaming

Since the food business uses heating and cooling significantly to pasteurize, commercially sterilize, refrigerate, dry, and freeze goods, heat transfer is a key topic in FE. Conduction, convection, and radiation are the three basic mechanisms for heat transport and radioactivity. However, in the kitchen, heating-related culinary techniques are labeled according to the heat transfer medium and its temperature: Direct fire (grilling, barbecue), hot oil or fat (sauteing, frying, confiting), air (roasting, baking), hot water (boiling, simmering, braising), and " steam (steaming) (Jose Miguel Aguilera 2018). The mass transfer process plays a crucial role in the thermal treatment of meat during cooking, and it is influenced by various factors such as heating rate, final cooking temperature, and time. In the Chinese culinary tradition, wet heating methods like steaming and boiling are commonly used for meat preparation. Steam, in particular, has been found to have significant effects on cooking time and cook values. Compared to water, steam has a higher energy transfer rate to the meat sample at a given medium velocity, resulting in a faster rate of heat transfer. This accelerated heat transfer can reduce the overall cooking time required for the meat. The use of steam in cooking can have several advantages. It can lead to shorter cooking times, which can be beneficial for both energy efficiency and maintaining the quality of the meat. Additionally, steam can help in retaining moisture and tenderness in the cooked meat by minimizing cooking losses. Overall, the choice of cooking method and the specific conditions employed, such as using steam as a heat transfer medium, can significantly impact the mass transfer process during thermal treatment. Understanding and optimizing these processes can contribute to

achieving desired cooking outcomes in terms of cooking time, tenderness, and moisture retention. (Yu Song *et al* ., 2021)

Reduced cooking losses and heterocyclic aromatic amine production are benefits of steaming, which involves a relatively mild heating technique. When compared to other cooking techniques like frying and roasting, steaming also lessens the oxidative alteration of beef proteins. Following the advancement of cooking techniques and the rising customer demand for premium meat products, low-temperature cooking techniques have gained popularity in the catering business. A high amount of moisture and nutrient retention, as well as more tenderness and juiciness, can be achieved by using the right mix of cooking temperature and time. However, low-temperature cooking frequently results in a strong, unfavourable metallic flavour because myoglobin denaturation is not as complete and there aren't as many volatile chemicals created by fatty acid degradation. by examining the results of four steaming procedures: traditional steaming at 100 °C, T100; low-temperature steaming at 75 °C, L75; stepwise steaming at 100 °C followed by 75 °C, S100-75; or stepwise steaming at 75 °C followed by 100 °C, S75-100. (Keyu Wang *et al., 2020).*