CHAPTER I

INTRODUCTION

1.1 Background

Nowadays, the awareness of consumers toward the nutritional content and impact of certain foods consumption is increasing. It is known that the consumption of meat products with high fat content can promote health risk such as heart disease. The development of vegetarian communities around the world are also increasing (Mehta, 2015). However, the existence of several meat products such as nugget, sausage and patty are needed in this modern era as people tend to choose foods with instant preparation. These meat products also can be good sources of protein. To overcome these problems, researchers are utilizing food science, biotechnology or other related knowledges to develop plant based meat products that can give similar characteristics and comparable nutritional contents (Kumar, 2016).

Patty is one of the most popular meat products in the world. According to Heinz and Hautzinger (2007), patty is processed meat composed of minced or grounded meat, filler, binder, fat and spices. It is usually made to round shape and consumed with round bread. The meat used can be derived from pork, beef or poultry. The utilization of meat on the ingredients of patty promotes high cholesterol content on this product. This problem can be overcome by making a vegetarian patty derived from plant based materials. Legumes, seeds and fungus are considered as plant materials that have comparable protein content with meat.

Utilization of these plant based materials also can increase the nutritive value of the products. Cowpea and oyster mushroom can are local products that can be considered as a good potential raw materials in making vegetarian patty as they contain comparable nutrition content to meat (Kumar, 2016).

Cowpea (*Vigna Unguiculata* L.) is a legume that originated from Africa. In Indonesia, it is considered as a local commodity as the production of this legumes is quite high in Java, Sulawesi and Nusa Tenggara Island. However, the utilization of cowpea for food production is still very low (Karuwal, 2017). Despite of the underutilization, the nutritional content of cowpea is very good, especially its protein content. This legume contains protein about 23%-32% and carbohydrate about 50%-60% with only 1% fat. In addition, cowpea also contains several minerals that are useful for human body (Jayathilake, 2018).

Oyster mushroom (*Pleurotus ostreatus*) is another local commodity that can be good material in making vegetarian patty. Oyster mushroom have been used in making several types of meat analogue especially nugget. It can promote chewy and meat like texture. Combining several types of plant such as legumes and fungus in making meat analogue might give better texture characteristics and higher nutritional value (Kumar, 2016). Oyster mushroom has high nutritional content as it contains protein about 23%-33% and carbohydrate about 36-68%. Moreover, oyster mushroom also has high dietary fiber content that can give meat like texture and contributes to better digestive system for human. It contains several essential amino acids that are very important for human healths (Yusfidasari *et al*., 2018).

Moreover, in making plant based or vegetarian patty, minor ingredients or chemicals can be used to improve the final texture or aid in texturization of raw ingredients. One of the most important additional material in making plant based meat products is binding agent. Hydrocolloids or starches are commonly added to fine-tune the water holding capacity, texture and emulsification properties of the final product. Carrageenan is considered as an hydrocolloid that is suitable to be a binding agent on meat analogue products. Addition of carrageenan can increase the effectiveness of water holding capacity and meat extender. However, the amount of carrageenan added must be precise to get the desired textural properties (Galanakis, 2018).

Nowadays, with the development of knowledge and technology, researchers also can synthesize meat flavours that do not contain meat as the ingredients at all. The terms for this kind of flavouring are still vary, however artificial flavour is widely used to refer to this kind of flavours. Artificial flavour itself can be made from natural ingredients which is provided in the nature or can be made by combining several types of chemical substance. In some plant based or vegetarian meat products, adding artificial flavour is proven to increase the palatability of the product (Mora and Andres, 2014). In Indonesia itself, the availability of artificial meat flavour is still low, however, commercial products of artificial chicken flavour can be found on some markets.

1.2 Research Problem

Nowadays, trend in consuming healthy low fat food keeps increasing. Generally, patty is considered as high fat food with total fat content about 25.09% and people tend to avoid meat products with high fat content that highly associated with heart disease. Plant based meat products or vegetarian meat can be the solution of this problem. However, the research and development on vegetarian meat is still low.

The research was based on the usage of oyster mushroom and cowpea as the main ingredients in making vegetarian patty. Cowpea and oyster mushroom are considered as local commodities with low utilization in making food products. Both cowpea and oyster mushroom have high nutritional value especially protein and low in fat content, so that these materials can be a good choices for vegetarian communities or people who stay away from high fat food. The ratio of cowpea and oyster mushroom as the main raw materials along with the amount of carrageenan as the binding agent and artificial chicken flavour must be known to produce vegetarian patty with good properties and high nutritional value.

1.3 Objectives

1.3.1 General Objectives

The general objective of this research was to utilize cowpea and oyster mushroom as the main ingredients with addition of carrageenan, and artificial chicken flavour in preparation of vegetarian patty.

1.3.2 Specific Objectives

The specific objectives of this research were:

1. To determine effect of different ratios of cowpea to oyster mushroom, and carrageenan concentrations on psychochemical characteristics of chicken vegetarian patty and to select best formulation.
2. To determine effect of different concentrations of artificial chicken flavour on sensory characteristics of chicken flavoured vegetarian patty and to select the best formulation of chicken flavoured vegetarian patty.