

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Soy sauce is made by fermenting soybeans, wheat, and salt with koji mold, lactic acid bacteria, and yeast. The "Honjozo" method, common in Japan, involves five steps: treating raw materials, making koji, fermenting and aging the moromi mash, pressing the mash, and refining. Soybeans are steamed to denature proteins, and wheat is roasted and crushed. They are mixed and inoculated with koji mold, then incubated for two to three days to produce hydrolyzing enzymes. The resulting dry mash, called koji, is critical to the quality of soy sauce, making the koji making process the most important step.

Mung beans sauce itself is using a similar method with the Japanese soy sauce version but fermenting it with koji yeast because koji help enzymes break down protein and carbohydrates into flavorful compounds resulting in the sauce offering a rich umami flavor and can be used in various culinary applications because it is very similar to original soy sauce.

Mung beans (*Vigna radiata*) is a crucial legume crop in South, East, and Southeast Asia, which produces about 90% of the world's supply. It has agronomic, economic, and nutritional benefits over other legumes, being drought tolerant, easy to cultivate, suitable for intercropping, and enhancing soil fertility. Nutritionally, mungbean seeds are rich in digestible protein, carbohydrates, flavonoids, phenolic acids, amino acids, lipids, and other beneficial minerals.

The mung bean is a vital source of nutrition worldwide, particularly valued for its high protein content (20.97–32.6%) and essential amino acids. Rich in minerals, iron, dietary fiber, and bioactive phytochemicals, mung beans serve as a functional food with significant health benefits. Mung beans contain polyphenols, polysaccharides, and polypeptides that have antioxidant properties that help prevent diseases. There are several other health benefits of mung beans

like reducing risk of type 2 diabetes, obesity, heart diseases, high blood pressure, LDL

cholesterol and many more that's why consumption of mung beans has been seen snowballing along with cereals. The *in vitro* digestibility of mung bean protein (70%) is more than soybean protein (65%). Phenolic acids play an important role in antioxidant properties, antimicrobial activity, and anti-inflammatory activities. Quercetin, kaempferol, and myricetin are the flavonoids which possess anti-mutagenic, anticancer, and anti-hypertensive activities.

Koji is made by inoculating mold spores onto substrates like rice, barley, or soybeans, chosen for their high starch content, which mold enzymes convert into fermentable sugars (Zhu & Tramper, 2013). The mold, usually *Aspergillus oryzae*, is considered safe by FSANZ (2016) and the US FDA (2018). Key conditions such as moisture, temperature, aeration, and substrate type must be optimized for *A. oryzae* to grow and outcompete unwanted microorganisms (Adams & Moss, 2008). Solid-state fermentation (SSF) is ideal for this process, as it mimics the natural habitat of filamentous fungi, supporting fungal growth and enzyme production better than submerged fermentation (Farinas, 2015; Chancharonpong et al., 2012).

The main idea of this paper is to find a new alternative for soy sauce to be substituted with mung beans because mung beans has a great potential from many aspects and benefits and give a good impact, such as from health benefits for those who have Anaphylaxis (soy allergies), it also has a lower cost, can help the local produce, and it hasn't existed yet. So it new product in F&B market to give people more options with this new alternative.

1.2 Objectives of the Study

The objectives of this study are following below :

1. The goal in order to make an alternatives of soy sauce with mung beans.
2. Offering a new product for culinary innovation and sustainable food production.