

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Red bean (*Phaseolus vulgaris* L) is a type of bean that is widely cultivated in Indonesia with a total production of 100,316 tons in 2014. Red bean contains quite high protein and carbohydrates (23.1% and 59.5%) which can be a source of nutrition. . Red beans also contain minerals (such as calcium, phosphorus and iron), vitamins (such as vitamins A and B1), and bioactive components, such as flavonoids and phytosterols (Kusnandar et al., 2020).

Kidney beans have very good nutritional content, this is very beneficial for the health of the human body, especially if processed properly and correctly. Dried red beans are a source of vegetable protein, complex carbohydrates, fiber, B vitamins, folacin, thiamine, calcium, phosphorus, and iron (Amin et al., 2018).

Tempe is a food that is familiar to Indonesian people. This food is rich in nutritional value, especially protein, besides being cheaper compared to protein sources originating from animals, the taste is also very popular. Apart from being a side dish for meals, tempeh is now also being developed as a snack. Indonesia is the largest tempe producing country in the world and the largest soybean market in Asia. As much as 50% of soybean consumption in Indonesia is done in tempeh, 40% in tofu and 10% in other products (such as tauco, soy sauce and others). The average consumption of tempeh per person per year in Indonesia is thought to be around 6.45 kg (Alvanie et al., 2019).

The stages that are very important in the process of making tempeh are soaking, boiling and fermentation. In the fermentation process of making tempeh occurs twice, the first is when soybeans and

non-soybeans are soaked in water. In this soaking occurs the formation of organic acids such as lactic acid, and also acetic acid caused by the growth of bacteria. This also causes the soybeans to be in an acidic state which allows fermentation by the fungus *Rhizopus sp.*¹⁵. The second fermentation occurs after giving yeast and packaging. It is in this fermentation process that hyphae are formed which will bind to each other so that the texture of the tempe becomes compact and soft and makes the color of the tempe white (Rahmani, 2020).

Tempe is very good for consumption by all age groups because the compounds contained in tempe are short peptide compounds, free amino acids, fatty acids and simpler carbohydrates which are easily absorbed by the body. The molds that grow on tempe produce protease, lipase and amylase enzymes which play a role in the process of breaking down complex proteins, fats and carbohydrates into simpler compounds. 10 The content of amino acids in tempeh is 24 times higher than soy milk. The fermentation process can also increase folic acid and form vitamin B12 from bacteria which is not found in other vegetable products (Nugraheni, 2020).

Red bean tempeh can be classified as a functional food, because it has added value to health, especially because of its antioxidant content which can counteract free radicals (Liputo et al., 2022).

1.2 THE OBJECTIVES OF THE STUDY

1. Finding and explore the benefit of red bean tempeh balls
2. To inform society the usage and advantages of red bean tempeh balls
3. Identify how to make red bean tempeh balls
4. Made new product that is healthy
5. Formulate this product that will meet the needs of certain market segments
6. Prepare costs and a definite price range for these products.