CHAPTER I
INTRODUCTION

1.1 Background of the Study

Global and national food industries have seen a major shift in consumption trends, driven by lifestyle changes and rising health awareness. Modern consumers increasingly seek foods that are tasty, nutritious, functional, and sustainable, fueling the growth of plant-based diets embraced by vegetarians, vegans, and flexitarians (Astuti & Adhi, 2021). The global plant-based market reached USD 44.2 billion in 2022 and is projected to grow at 12.4% CAGR through 2030 (Grand View Research, 2023), spurred by concerns over health, animal welfare, and the environment (Aschemann-Witzel & Peschel, 2019). This creates strong opportunities for innovation in food technology. In Indonesia, the snack market is also expanding rapidly. Snacks have become an integral part of Indonesian consumer culture, with surveys showing Indonesians eat snacks more frequently than main meals (Amadea, 2025). Revenue in the savory snack segment is expected to hit USD 8.16 billion in 2024, growing 8.31% annually (Statista, 2024). At the same time, consumers are becoming more critical, paying closer attention to nutritional labels (Indriyani, 2025). This is largely due to the fact that most snack products available on the market are still dominated by items high in calories, saturated fats, and sodium, yet low in fiber and other essential nutrients (Pratama, 2022). The gap between the high frequency of snack consumption and the growing awareness of healthier options creates a promising market niche for the development of innovative, plant-based healthy snack products.

One form of innovation that can be pursued is through the diversification of popular Indonesian snack products, such as fried sausages, commonly known as *"sosreng."* Unlike regular sausages, *sosreng* in this context refers to dry, crispy fried sausage chips that gained popularity through social media platforms like TikTok. *Sosreng* is a snack made from thinly sliced sausage that is deep-fried until it reaches a crispy chip-like texture, then packaged and sold with a

variety of savory and spicy seasonings. This snack has become a best-selling product in the online market and is widely favored by the Indonesian public for its rich umami flavor. Considering the high consumer interest in this trendy snack, it presents a highly promising base for further product innovation. Unfortunately, most *sosreng* products currently on the market are conventionally made from processed meat sausages, which are generally classified as ultra-processed foods high in sodium, saturated fats, and preservatives (Monteiro et al., 2019). Developing a vegetarian version of *sosreng* represents an innovative step that not only meets the growing market demand for plant-based products but also adds value in terms of health and uniqueness amid current food trends.

In developing this vegetarian *sosreng* product, the selection of the main ingredient is key to its success. Oyster mushrooms (*Pleurotus ostreatus*) were chosen as the primary ingredient due to their remarkable potential as a meat substitute. Various studies have proven the feasibility of oyster mushrooms as a base ingredient for vegan sausages because of their superior characteristics (Yuliana, 2018). Oyster mushrooms are relatively rich in dietary fiber, vitamins, and minerals, yet low in fat and calories (Widyastuti & Sari, 2020). Moreover, the fibrous and chewy texture of oyster mushrooms after cooking can closely mimic the texture of meat, making them highly suitable for processed products like sausages (Rahmawati, 2017). This advantage is further supported by the mushroom's natural umami flavor, which enhances the savory taste of the final product (Santoso & Wijaya, 2019). To further boost nutritional value and enrich the product's flavor and texture complexity, this formulation is also supported by other beneficial plant-based ingredients.

The use of tempeh and isolated soy protein (ISP) primarily serves as a source of plant-based protein. Tempeh was chosen not only to significantly increase protein content, but also to provide a firmer structure and a distinctive savory flavor from fermentation that is familiar to the Indonesian palate, thereby strengthening the sausage's character (Sari, 2020). Combining several plant-based protein sources, such as mushrooms and tempeh, has also been proven

effective in increasing total protein content and improving the organoleptic qualities of innovative food products (Lestari, 2018). The acceptance of a food product is highly determined by its sensory quality, which is evaluated through sensory testing (Adawiyah et al., 2023). Sensory testing is defined as the scientific method used to evoke, measure, analyze, and interpret human responses to the appearance, aroma, taste, and texture of a food product (Khairunnisa & Arbi, 2021).

Therefore, the production process of this vegetarian *sosreng* involves a series of steps aimed at achieving optimal sensory quality. The process begins with the preparation of raw materials, which oyster mushrooms and tempeh are steamed. Steaming oyster mushrooms and tempeh is a crucial step. It serves to inactivate polyphenol oxidase (PPO) enzymes in mushrooms, which can cause browning, and to soften their texture (Fellows, 2017). For tempeh, this treatment is important to deactivate the lipoxygenase enzyme, which is the main cause of the distinctive beany odor of soybeans (Astuti et al., 2018). The next step involves blending all ingredients using a food processor, while ice cubes or cold water are added to maintain a low temperature in the mixture. Controlling the temperature during this process is vital to ensure the formation of a stable emulsion, which is key to achieving a cohesive sausage texture that does not break apart during cooking (McClements, 2015).

Once all is finely blended, the mixture is combined with tapioca flour, cornstarch, and Isolated Soy Protein (ISP). ISP are used at a total concentration of 8% of the mixture's weight. Research has shown that adding ISP at the 8% level has been proven effective in significantly improving elasticity and emulsion stability, resulting in sausage products with the best characteristics (Hidayat et al., 2018). Previous research also supports that 8% concentration of ISP yields excellent results in vegetarian sausage formulations (Sandi, 2022). ISP acts as an emulsifier and water binder, playing essential roles in creating the chewy and compact texture characteristic of sausages (Zorba & Kurt, 2021). The dough is then refrigerated for stabilization, allowing for complete hydration of the binders and the formation of a denser gel network (Purnomo & Anam,

2019). Afterward, the dough is stuffed into cellulose-based sausage casings, which are non-edible and free from animal collagen, making them suitable for vegetarian products. The sausages are tied and steamed until fully cooked. Once cooked, the sausages are peeled from their casings and thinly sliced, then deep-fried to achieve a crispy texture. The final step involves stir-frying the *sosreng* with a spicy kaffir lime leaf seasoning to enhance the flavor.

1.2 Objectives of the Study

The objectives of this study are following below:

1. Creating a vegetarian *sosreng* as an innovative snack product that provides an alternative to conventional *sosreng*, which are commonly made from processed sausages high in sodium and saturated fat.
2. Utilizing the potential of oyster mushrooms as the main ingredient, combined with tempeh, to produce *sosreng* products with sensory characteristics (taste, aroma, texture) that are well-accepted by consumers.