I. INTRODUCTION

1.1 Background

Throughout history, seafood has been valued as a significant food source because of its well-known nutritional and health benefits, sensory features, and ease of digestion. It also has a high biological value and is a rich source of protein (Jayasekara, 2020). Despite the aforementioned health-benefiting values of seafood, there is an increasing need for people to change from animal-based diets to plant-based diets for several reasons, including concerns about the environment, sustainability, human health, and animal welfare (Kazir & Livney, 2021; Profeta et al., 2021). Meeting the need for animal products by providing high-quality protein without exceeding the critical limit of natural resources is one of the significant issues in the food industry. By 2050, the population of the world is predicted to reach 9 billion people, and meat consumption is predicted to rise due to increasing incomes in industrialized nations.

According to Tee & Siow (2014), fishball, one of the processed seafood products, is gaining interest in several countries, such as Australia, Japan, the United States, and Southeast Asia. An increasing market exists for food analogs that imitate fish meat's structure, texture, and sensory attributes so that vegetarians and vegans who refrain from eating seafood for moral and environmental considerations can consume comparable alternative foods without harming animals (Kazir & Livney, 2021). It is necessary to simulate the nanometric fibrous structure that results from tissue-, cellular-, and molecular level structures, particularly from intra- and intermolecular bonds between protein chains to produce the internal structure and texture of fish or seafood (Sha & Xiong, 2020).

Soy protein isolate (SPI) is frequently used in food formulations due to its superior nutritional value, usability, and health advantages. Untreated soy proteins have restricted

functionality, such as gelation, emulsifying, and other properties (Nishinari et al., 2014). As a result, the SPI structures must be modified in order to demonstrate the above-mentioned expanded capabilities. A technique that successfully enhances the functional qualities of proteins is protein-polysaccharide conjugation via the Maillard reaction (MR) (Ran et al., 2022a) which is proven to increase their solubility, emulsifying characteristics, and thermal stability (Ran et al., 2022a; Xiao et al., 2020). Konjac Glucomannan (KGM), on the other hand, is a water-soluble polysaccharide extracted from *Amorphophallus konjac* K. Koch tubers (Behera & Ray, 2016). While KGM may possess several health effects such as reducing cholesterol, modifying carbohydrate metabolism in diabetic people, and improving intestinal activity, it is generally challenging to include KGM in food formulations due to its high viscosity and molecular weight, which limits its application (Rabbani et al., 2020; Yang, 2020). Therefore, it is crucial to hydrolyze KGM before further use. It has been reported that after being subjected to enzyme hydrolysis, the application of konjac glucomannan hydrolysate (KGMH) in food applications is enlarged (Rabbani et al., 2020).

Most studies on the wet-heating-induced Maillard reaction that have been published to date have focused on the modification and effectiveness of proteins' functional characteristics. Limited information is available on using SPI-KGM in developing food products and its effects on the physicochemical qualities of animal-based substitutes. Therefore, this study aims to use fishballs as a processed product and to incorporate SPI-KGM glycated products to develop plant-based fishballs (PFB). The significance of this will give a greater insight into the modification of the structure-function of SPI through the Maillard reaction and applying the conjugates in plant-based food products.

1.2 Objectives

a. To evaluate the physicochemical properties of plant-based fishball (PFB) with soy protein isolate (SPI) and konjac glucomannan hydrolysate (KGMH) glycated product

b. To evaluate the sensory acceptability of plant-based fishball (PFB)

1.3 Hypotheses

H0: There is no significant difference in the physicochemical properties of PFB added with SPI and KGMH compared to without the addition of SPI and KGMH.

H1: There is a significant difference in the physicochemical properties of PFB added with SPI and KGMH compared to without the addition of SPI and KGMH.

H0: There is no significant difference in the consumer acceptability for PFB without and with the addition of SPI and KGMH.

H1: There is a significant difference in the consumer acceptability for PFB without and with the addition of SPI and KGMH.