

CHAPTER I

INTRODUCTION

1.1 Background of the Study

One of the major challenges in today's food industry is the significant amount of food waste, including nutrient-rich by-products that remain underutilized. Okara, or soy pulp, is a prime example, a by-product from soy milk and tofu production that is often discarded despite its high nutritional value. It is rich in dietary fiber, plant-based protein, unsaturated fatty acids, calcium, B-complex vitamins, and natural antioxidants (Asghar et al., 2023). However, due to its high moisture content and perishability, okara's potential as a functional food ingredient has not been fully explored.

A promising innovation addressing this issue is the transformation of okara into vegan snack products, particularly chips. Thanks to its naturally fibrous and soft texture, okara can be processed into crispy chips when dried and baked or fried. Unlike conventional chips made from refined starches and low in fiber, okara chips offer a healthier profile high in fiber and protein, with a mild, neutral taste that pairs well with a wide range of seasonings. This innovation builds on previous research, such as that by Chen et al. (2016), who explored the potential of okara in snack production and found it to be a viable ingredient for creating nutritious alternatives to traditional snacks. Being fully plant-based, these chips offer an ideal option for vegan consumers who are increasingly seeking functional, wholesome snacks.

To further improve the nutritional and sensory qualities of the chips, this innovation utilizes carrot peel flour, an agricultural by-product that is rich in beta-carotene, fiber, and natural sweetness. The combination of okara and carrot peel flour results in a product with a more vibrant color, improved texture, and added health benefits, all without the use of synthetic additives. By utilizing carrot peel, a food waste product, this innovation not only reduces the environmental impact of agricultural waste but also promotes the principles of upcycling and zero-waste cooking, which is becoming increasingly valued in

sustainable food systems. This approach echoes findings from scholars like Singh et al. (2018), who highlighted the importance of agricultural by-products in minimizing food waste while adding nutritional value.

Compared to other snacks derived from food waste, which often face challenges such as off-putting aromas or poor texture, okara–carrot peel chips stand out for their neutral flavor, textural stability, and nutritional value. Research by Li et al. (2020) on food waste-derived snacks often highlighted issues with undesirable odors or poor mouthfeel, but okara chips address these concerns through their natural, appealing taste and texture. These attributes make them more acceptable to health-conscious and vegan consumers seeking plant-based, functional snacks that do not compromise on taste or quality.

Ultimately, this innovation delivers value on two fronts: environmentally, by reducing food waste and promoting sustainable food practices; and nutritionally, by offering a high-fiber, chemical-free snack aligned with modern dietary preferences. The use of okara and carrot peel flour in creating these chips not only provides an alternative to traditional snacks made from refined ingredients but also helps reduce food waste from both soy and carrot production. Chips made from okara and carrot peel flour are more than just a novel food product—they represent a sustainable, health-forward response to the evolving demands of the food industry, providing a compelling alternative to traditional snack options, while catering to the growing demand for plant-based and vegan food choices.

1.2 Objectives of the Study

The objectives of this study are as follows:

1. To develop a crispy snack product using soy pulp (okara) as a primary ingredient, with the aim of reducing food processing waste and promoting sustainable utilization of by-products in culinary innovation.
2. To evaluate the nutritional, sensory, and textural qualities of okara-based crisps, in order to assess their viability as a healthy, plant-based alternative within the functional snack market.