

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the Study

In general, tomato sauce is one of the most popular food accompaniments for many people. It has a distinctive taste that is balanced from sweet, sour, to savory, which is one of the reasons why tomato sauce is used as a companion for various foods with different flavors. In addition, tomato sauce has the flexibility to be used as a base for food recipes that make the food served even more rich in flavor and interesting. Aside from that, tomato sauce is also packed with nutrients such as lycopene that protect cells from damage.

Nowadays, most foodstuffs sold in the market contain preservatives. The widespread use of artificial preservatives in food products has raised significant public health concerns globally. Extensive research has highlighted the potential risks associated with these additives, including implications for neurological health with prolonged exposure. This is one of the reasons why the authors explored pineapple-based sauces as a healthier alternative to traditional ketchup that integrates food science understanding, consumer health preferences and sustainability principles. This section provides a comprehensive overview of the rationale behind the selection of pineapple and the utilisation of lacto-fermentation in product development. In response, there is a growing movement towards natural preservation methods in food production, aiming to reduce health risks and fulfil consumer demand for safer and more sustainable food options (Dhar, 2023).

Pineapple is celebrated not only for its distinctive flavor profile, characterized by natural sweetness and acidity, but also for its nutritional richness. Scientific studies have identified pineapple as a natural source of essential enzymes, vitamins (particularly vitamin C), and natural acids. These

components not only enhance the sensory attributes of foods but also offer potential health benefits, including digestive support and immune system enhancement. By incorporating pineapple into food processing, this study seeks to capitalize on these natural benefits to create a product that aligns with contemporary consumer preferences for minimally processed, health-promoting foods (Juan, 2020).

At the heart of the development of pineapple-based sauce lies the utilization of lacto-fermentation, an age-old preservation technique revered for its ability to enhance nutritional value and prolong shelf life naturally. Lacto-fermentation involves the metabolic activity of *lactic acid bacteria (LAB)* and *Bacillus species*, which ferment carbohydrates into lactic acid and other beneficial bioactive compounds. This process not only improves the flavor and texture of foods but also introduces probiotics that support gastrointestinal health and bolster immune function. Scientific literature consistently underscores the efficacy of lacto-fermentation in preserving nutrients and enhancing the bioavailability of essential vitamins and minerals found in pineapple and other fermentable substrates (Skinner, 2022).

The decision to innovate with pineapple-based sauce also reflects evolving consumer preferences and market dynamics. Today's consumers are increasingly informed and health-conscious, actively seeking food products that not only taste good but also contribute to their overall well-being. The development of pineapple-based sauce therefore not only meets these demands but also positions itself as a flavorful and nutritious alternative to conventional condiments (Manthou, 2021).

The exploration of pineapple-based sauce as a culinary innovation is grounded in a holistic approach that considers scientific research, consumer health concerns, and sustainable food practices. By harnessing the natural attributes of pineapple and the time-tested method of lacto-fermentation, this study aims to contribute to the development of innovative food products that

promote health, sustainability, and consumer satisfaction in the global marketplace. Through ongoing research and development, this initiative seeks to set a precedent for future advancements at the intersection of nutrition, technology, and consumer preferences (Cardona, 2022).

## **1.2 Objectives of the Study**

The aims of the research are outlined as follows:

1. To create an alternative to tomato sauce containing preservatives, this study aims to develop pineapple-based tomato sauce as an alternative to tomato sauce containing preservatives.
2. To explore the health benefit advantages of lacto-fermentation as a preservation method in the production of pineapple tomato sauce.