CHAPTER I. INTRODUCTION

1.1 Background

In recent years, the increasing need for different kinds of food, especially those that are low in fat and carbohydrates, has arisen due to common health problems (Ahn et al., 2020). This demand has led to the creation of a food product that is both delicious and nutritious while also containing less fat and carbs. Consuming too much-saturated fat and high sugar intake has been shown to increase the chance of heart-related issues such as obesity. Obesity has become a major concern of public health issues that have grown across the world in recent decades (Chooi et al., 2019). It has a detrimental effect on all physiological systems of the body and can increase the risk of developing a variety of diseases such as diabetes, cardiovascular disease, and cancer (Chen et al., 2018). According to Harrison et al. (2019), the limited intake of saturated fatty acids is around 10% of total energy intake per day. Consequently, reducing saturated fat consumption is important in global dietary recommendations to help people in lowering their risk of health problems (Yasin & Shalaby, 2013). Therefore, the possible solution to this problem is to modify or substitute a product containing high fat with a healthier option which is known as cheesecake.

Cheesecake is a popular baked or unbaked dessert that consists of biscuits, pastry or sponge cake, and cheese as the main ingredient (Demir Özer et al., 2021). In world cuisine, different cheesecake recipes use different types of cheese such as cottage cheese, ricotta cheese, and cheddar cheese. The different types of cheeses in making cheesecake have a significant impact on its sensory properties, including texture, taste, and appearance (Luthfi & Sanggramasari, 2018). Generally, cheesecake is classified into two types which are baked cheesecake and chilled cheesecake. Both types of cheesecake have many texture variations, including soft, light, and melted in the mouth, due to the cream cheese that is commonly used. Unfortunately, cream cheese contains quite a high amount of fat, 33%, which can be considered unhealthy (Jørgensen et al.,

2019; USDA, 2019). Because of this, an alternative ingredient of cream cheese made from Greek yogurt with a lower fat content will be utilized in this study to make cheesecake.

Greek yogurt, which is also referred to as yogurt cheese or *labneh*, is made by straining regular yogurt using a cheesecloth for a night to remove most of the liquid whey (Gyawali et al., 2022). This whey removal process produces a final product with a higher solid content and a thicker texture compared to regular yogurt but not as dense as cheese. Greek yogurt has several nutritional benefits and contains only 6-11% fat (USDA, 2019). The traditional recipe for Greek yogurt includes three main components which are milk, cream, and bacterial cultures. In this study, Greek yogurt will be used mainly because of its low-fat content, creamy texture, and tangy flavor. Greek yogurt has also been claimed to have a rich nutritional value including a source of protein, probiotics, lactose intolerance free, vitamin D, vitamin B12, calcium, phosphorus, and magnesium (Chatterjee et al., 2020).

Thus, this study will be carried out by substituting cream cheese with different types of Greek yogurt (*GY*) to analyze and compare the characteristics effect on the cheesecake. This study aims to develop a cheesecake using three different types of Greek yogurt: high-protein GY, regular GY, and low-fat GY as a cream cheese substitution. The effects of cheesecake characteristics that will be evaluated are the physicochemical properties (color, hardness, viscosity, and pH) and the sensory properties (taste, odor, texture, and overall acceptability).

1.2 Objectives

The objective of this study is to analyze and compare the cheesecake characteristics by using different types of Greek yogurt as an alternative substitution for cream cheese. The characteristics that will be analyzed are the physicochemical analysis (color, hardness, viscosity, and pH) and sensory properties (taste, texture, odor, and overall acceptability) using the 9-point hedonic scale test.

1.3 Research Scope

The scope of this research includes:

1. Doing sample preparation which includes the preparation of the raw materials and ingredients, cheesecake making, followed by the application of using 3 different *Greek Yogurt* types: high protein *GY*, regular *GY*, and low-fat *GY* in the process.

2. Analyzing the physicochemical properties (color, hardness, viscosity, and pH) of cheesecake.

3. Analyzing the sensory properties (taste, texture, odor, and overall acceptability) to determine the consumer acceptances of the cheesecake.

1.4 Hypothesis

1.4.1 Physicochemical Analysis

1. **H_0**: There is no significant difference between 4 formulas of cheesecakes in terms of color.

   H_1: There is a significant difference between 4 formulas of cheesecakes in terms of color.

2. **H_0**: There is no significant difference between 4 formulas of the batter in terms of pH.

   H_1: There is a significant difference between 4 formulas of the batter in terms of pH.

3. **H_0**: There is no significant difference between 4 formulas of cheesecakes in terms of hardness.

   H_1: There is a significant difference between 4 formulas of cheesecakes in terms of hardness.

4. **H_0**: There is no significant difference between 4 formulas of the batter in terms of the viscosity.

   H_1: There is a significant difference between 4 formulas of the batter in terms of the viscosity.

1.4.2 Sensory Analysis (9-point Hedonic Scale)

1. **H_0**: There is no significant difference between 4 formulas of cheesecake in terms of taste.

   H_1: There is a significant difference between 4 formulas of cheesecake in terms of taste.

2. H_0: There is no significant difference between 4 formulas of cheesecake in terms of odor.

   H_1: There is a significant difference between 4 formulas of cheesecake in terms of odor.

3. H_0: There is no significant difference between 4 formulas of cheesecake in terms of texture.

   H_1: There is a significant difference between 4 formulas of cheesecake in terms of texture.

4. H_0: There is no significant difference between 4 formulas of cheesecake in terms of overall acceptability.

   H_1: There is a significant difference between 4 formulas of cheesecake in terms of overall acceptability.