# CHAPTER I

# INTRODUCTION

## 1.1 Background

In recent years, the public has become more conscious of their health, as well as their diet. Therefore, there is an increase in the demand for low-calorie foods, specifically food that are low in fat since fat are often linked with cardiovascular disease. However, reducing the amount of fat in the food composition may result in altered physical, textural and olfactory factors that influence the overall palatability (Colla *et al*, 2018). As fat has crucial role in food, the development of low fat variants with similar quality to its full fat counterparts depended on replacing the fat with alternative ingredients. Therefore, a lot of ingredients have been developed specifically for fat replacement (Jones, 1996).

In baked products, fat plays an important role to improve texture, mouth feel and flavor, as well as increasing volume and softness in the final product. Various fat replacer, whether commercial or natural has been proven to have some degree of success in baked products. Cake is one of the most important bakery product in Indonesia, according to the data of consumption of prepared food or beverages from 2014 to 2018 (Setjen Pertanian, 2018).

There are various types of fat replacer that can be used in the production of cake, such as: complex carbohydrates, gums, gels, whole food purees and

products, or even combination of fat replacers mentioned. Generally, complex carbohydrates are successful fat replacers due to their ability to bind with water and forming paste that are similar to texture and viscosity of oil emulsifying in food product. Inulin (fructans), maltodextrin and plant fibres are complex carbohydrates that are mostly used as fat replacers. In several research**,** various fruit and vegetable purees has been used as fat replacer in baked goods with some degree of success, such as bean puree and green pea puree in biscuit, as well as avocado puree in cake and biscuit (Colla *et al*., 2018).

Cauliflower (*Brassica oleracea*) is one of the vegetables from the family Brassicaceae, which has undeveloped yellow to creamy white colored compact head or curd as its edible portion. It has considerably high fiber content of around 8% of DV (Daily Value) per 100 g of cauliflower, as well as negligible amount of fat (Bhattacharjee and Singhal, 2018). Other than that, cauliflower is also a good source of vitamin C, vitamin K, folate and potassium, as well as containing natural chemicals that are beneficial in cancer prevention. It is also inexpensive, and are available all year round (NDH, 2007). Due to the considerably high amount of fiber contained in cauliflower, it is expected to be a successful fat replacer in cake.

## 1.2 Research Problem

Cauliflower is proven to have considerably high amount of fiber that can be used as complex carbohydrate based fat replacer. However, fresh cauliflower has relatively low shelf life and it is difficult to standardize the quality. Therefore in this research two form of cauliflower (fresh and dried) will be used

as a fat replacer in the making of cake.

## 1.3 Objectives

### 1.3.1 General Objectives

The general objective of this study was to determine the effect of cauliflower as fat replacer towards the physical and sensory characteristic of sponge cake.

### 1.3.2 Specific Objectives

The specific objectives of this research were:

1. To determine effect of cauliflower product form and concentration of cauliflower as a fat replacer on physical and sensory characteristic of sponge cake.
2. To determine the optimum level of fat replacement by using cauliflower.