CHAPTER I

INTRODUCTION

1.1 Background

In the wake of the high mobility nature of the modern times, the interest towards instant, ready-to-eat meals is on the rise. One of consumers' favorites for such instant treats is frozen desserts which is shown by the recent growing interest for businesses serving the food. This is especially true when paired with a publication by Packaged Facts (2017) and research on consumer behavior conducted by Giao (2018) which indicated the increasing demand for foods with relatively short processing time, good flavor, with diverse menu to choose from, and served in spaces with eye-catching layout, intended for gathering with friends – all of which are generally available in modern cafes serving ice cream as one example of frozen desserts. According to publications by Packaged Facts (2017), U.S. Code of Federal Regulations (CFR) Chapter I, Title 21 (2020), and SNI by *Badan Standarisasi Nasional* (1995), the production of ice cream is to follow certain parameters, including, total soluble solids, fat content, weight per volume, and milk addition percentage.

These days, the serving of ice cream can also be done in a rather instantaneous manner, that is, by using powdered ice cream mixes which forms an ice cream in its true form upon addition of the powder with water, mixing, and storage in low temperature. The sensory and physiological characteristics of instant

ice cream is designed so that it is akin to that of ice cream made in a more conventional manner and is also affected by a number of factors such as emulsifiers, flavorings, stabilizers, and other materials added into the mix, just as much as traditionally-made ice cream is (Mulyani, *et al.*, 2017; Goraya and Bajwa, 2018). The employment of emulsifiers and stabilizers has been extensively studied on and was understood to bear the ability of providing desirable properties on ice cream, that is, by altering its viscosity, melting properties, texture, mouthfeel, etc., which exact properties are displayed in the employment of maltodextrin, xanthan gum, and DATEM which are materials often used as a mean to improve the physicochemical properties of food products such as ice cream (Bahramparvar and Tehrani, 2011; Lück *et al.*, 2012; Sonwane and Hembade, 2014).

The utilization of said additives were found to cause changes in different properties of ice cream produced. The addition of maltodextrin was found to be beneficial in adding the body of the ice cream by acting as a substitute for fat and constituting air in the ice cream mix, while xanthan gum in ice cream mix was found to result in products yielding better viscosity and shear-thinning properties, both of which help yield what are considered defining attributes of ice cream; likewise, the addition of DATEM is understood to help with product dynamic moduli which helps retain ice cream textural quality in such low storage temperature (Bahramparvar and Tehrani, 2011; Jasrotia, 2011; Sonwane and Hembade, 2014).

In the production of such dessert, be it in its rather conventional fashion or in its modern, instant version, the manufacture is very much influenced by consumers' demands and the intrinsic factors of the ice cream affecting the quality

of the end products. The utilization of emulsifier and stabilizers, especially when used too much, has been understood to cause unwanted properties of to arise in the final product, such as objectionable flavor, undesirable product viscosity, etc., that may, in turn, cause lower sensorial acceptability of the product (Syed *et al.*, 2018). Based on these premises, research and development of instant ice cream along with its emulsifiers and stabilizers will always come in handy and be beneficial to conduct for the betterment and optimization of the products, and terminally, to fulfill consumers' demands which, in turn, lead to the disposition of this thesis research wherein reformulation of powdered chocolate drink was carried out in an attempt of creating an instant ice cream product with the addition of stabilizers and emulsifiers to increase the physicochemical and sensorial properties of the product.

1.2 Research Problem

The reformulation of instant ice cream mix powder from powdered chocolate drink requires an extensive study on its properties in order to have its product be qualified for classification as an ice cream and to overcome the lack of physicochemical and sensorial qualities of that of an ice cream made in a traditional manner. The addition of emulsifiers and stabilizers were used in the making of instant ice cream powder. With the knowledge that emulsifiers and stabilizers have the ability to give both desirable and adverse effects on food product, the study on ratios of emulsifiers and stabilizers added was found necessary to carry out.

1.3 Objectives

1.3.1 General Objective

The general objective of this thesis research was to determine the optimum amount and ratio of stabilizers and emulsifiers to increase the overall quality of the frozen dessert.

1.3.2 Specific Objective

1. To determine the effects of different maltodextrin concentrations on the quality of production ice cream mix.
2. To study about the effects following the addition of xanthan gum and DATEM at different ratios to the quality of production ice cream mix.
3. To conduct quality assessments based on physicochemical, sensorial, and overall properties of the end product in comparison with commercial products.