

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

By 2050, the world's population rate will have increased by two times the current amount. Demand for agricultural products such as cotton, wheat, vegetables and fruit will continue to increase because of the population growth and also rising income. Due to changing consumer habits and population growth. According to the World Economic Forum, Indonesia's dairy industry has seen market demand more than 10% annually over the past decade. It is estimated around 11.7 liters per annum of milk consumption per capita in Indonesia, which is significantly lower than the 22 liters consumer per capita in the Philippines and 31 liters in Thailand.

However, according to previous research conducted, dairy products are correlated with many negative health outcomes due to their Saturated Fatty Acid (SFA) content, which may lead to increased Low-Density Lipoprotein (LDL) levels, therefore an increased risk of cardiovascular disease (Artaud-Wild, 1993). Consuming whole-fat dairy products can produce unwanted health effects that can increase LDL cholesterol level. Products like ice cream, sour cream, basically anything that contains milk are high in cholesterol.

In Indonesia, ice cream markets have been forecasted to extend at the rate of 7.8% based from a CAGR (compound annual growth rate) of the year 2014-201. According to Euromonitor, that ice cream markets in Indonesia are immense, reaching 158 million liters and also the largest in southeast Asia. This statement is also supported by Baihaqi who also claims that the ice cream market will continue to expand up to 16% in following years.

However, ice cream is still made with a full fat dairy product that can raise the cholesterol level. Cholesterol is a waxy substance that can be found in human and animal cells especially in the brain, kidneys and liver (Scherr-Cherr, 2016). It is used by the body to maintain cell structure and function, cholesterol

also synthesizes bile acids that are necessary for fat digestion. Cholesterol is also divided into two types; high-density lipoprotein (HDL- cholesterol), believed to carry cholesterol to the liver where it is broken down and removed from the body. High levels of HDL have been linked to lower risk of heart disease. The second type is the low-density lipoprotein (LDL- cholesterol) which has a high ratio of fat to protein. This can eventually lead to build up in the walls of the blood vessels causing a heart attack, stroke, or hypertension (Mayoclinic, 2018).

According to the World Health Organization, Hypertension is when blood pressure is too high. The relation between high blood pressure and high cholesterol goes both ways. When the body can't clean the cholesterol from the bloodstream, that excess cholesterol can deposit along artery walls. When arteries become stiff and narrow from deposits, the heart has to work overtime to pump blood through them. This causes blood pressure to go up and up.

For adults, a good total of blood cholesterol is below 200 mg/dL (milligrams (mg) of cholesterol per deciliter (dL) of blood), these levels are correlated with relatively low risk of heart disease. While levels in the range of 200-239 mg/dL are considered "borderline" and lastly if above 240 mg/dL is associated with high risk and need of treatment. However, in Indonesia, the estimated cholesterol level for Indonesians reaches 230-250 mg/dl, the same as the cholesterol level for the population of the United States (US), said a cardiologist from Siloam Hospitals. The deaths triggered by high cholesterol reached 25 per 1,000 men in Indonesia (Djoko Maryono, 2015). This death rate is much higher than other countries, such as Japan, only three per 1,000 men. This is because the average Japanese cholesterol level is only 150 mg/dl.

Furthermore, Ice cream with a lack of fiber problem can cause constipation and weight gain. Lastly, some products may use additives, artificial flavoring and coloring that can lead to an allergic reaction for some customers, the chemical compounds may accumulate inside the body. Problems that usually arise concerning consumptions of ice creams are the lack of nutrients such as vitamins, minerals and fibers, followed by low physical quality such as poor texture and quick melting time. According to the

Ministry of Health of Indonesia, in 2010 people in Indonesia haven't fulfilled the Nutrition Adequacy Ratio (NAR) that has been predetermined. According to the Recommended Daily Allowance (RDA) the right amount should have been 25 grams per day, but Indonesian people only consumed, on the average, 10.5 grams per day.

With the high level of protein, containing abundant poly-unsaturated fatty acid (PUFA), and various bioactive compounds, soy milk has been approved to be the most nutritious beverage. According to the U.S. Department of Agriculture 2019, soy milk contains 2.88 grams of protein for every 100 grams of it, which is comparable to bovine milk that has 3.15 grams of protein for 100 grams of it. Soy milk composed of a well-balanced amino acid with high true ileal digestibility of 92.3%, it produces a digestible indispensable amino acid score (DIAAS) of 117% in which can be classified as an "excellent or high" quality of protein source (DIAAS  $\geq$  100%) (Food and Agriculture Organization, 2011).

On the other hand, plant-based milk such as soymilk is prominent as a milk substitute and nutritious for milk protein allergy people and lactose digestion problems. Plant based diets become consumer interest and encourage healthy lifestyles through foods, soymilk thrive and branches out in its own plant-based food market. It is healthy and very important for people with the mentioned problem and becomes the first product to ever be prepared and consumed by humans since long ago.

People with lactose intolerance are also affected by the lack of ability to digest lactose because of the lack of enzymes that decompose lactose and also milk protein allergy. This concludes that lactose intolerant people cannot eat ice cream with cow milk base. In reality, around 75% of the world's population is lactose intolerant. Although, consuming dairy products is natural and unproblematic for some people. However, there are still many people who can't drink cow's milk because of milk allergy or because of a preferred lifestyle such as veganism. Lactose intolerance is common in children; approximately 70% of children and adolescents worldwide are lactose intolerant. In Indonesia,

especially Jakarta, 21% of children aged 3-5 years are lactose intolerant, 58% of children 6-11 years old and research in Manado found a lactose intolerance rate of 63.2%.

With this we want to try to make ice cream not made from cow's milk and cream but substitute it with soy milk with the aim of producing ice cream that is lower in calories and lower in cholesterol but does not lose its nutrients and deliciousness.

## **1.2 Scope of the Problem**

Many Indonesians are familiar with soy milk but some of them prefer almond milk because of the unique taste of soy milk. Therefore, we want to introduce soy milk ice cream to the public, providing information and products to people who intend to pay attention to the nutritional value in food and for people who like trying new products.

## **1.3 Business Opportunities**

Siahaan and Thiodore (2021) stated that consumers put more concern on the food indicators, which mostly is about its healthiness, followed by safety and quality. Soy milk has been approved to be the most nutritious beverage as the plant-based milk is recognized as a nutritional milk that can be used as a substitute for lactose intolerant people and people with milk protein allergies. According to the Chairman of Commission IV DPR RI Sudin (2022), the demand for soybeans is

7.2 million tonnes. Meanwhile, soybeans production is almost 2 million tons. Meaning that 90 percent of them are imports.

According to Aice, a brand from Singapore that focuses on producing ice cream in Indonesia, there are 150-200 million potential consumers under the age of 40. In Indonesia, the ice cream consumption is estimated at 2-4 Liter per capita. The level of per capita consumption that is still low and the demographics of Indonesia's population make the potential of this industry even greater. In 2021, The Indonesia Ice cream market was valued at \$575.8 million. The market is projected to grow at a CAGR of more than 6% during the forecast period. Moreover, the take-home and bulk ice cream category is forecast to register fastest value growth while, artisanal ice cream category is forecast to register fastest volume growth during 2021-2026.

