

## **CHAPTER I INTRODUCTION**

### **1.1. Background**

Milk can be defined as a pale liquid produced by lacteal secretion of female mammals. Milk is the primary source of nutrition that produced for the nourishment of young mammals before they are able to digest any other foods. Milk that is produced by cattle can be identified by the name like “goat milk”, “cow milk” or “horse milk”. Meanwhile, other fluids resembling milk from the physical appearance but derived from a vegetable source are called “soy milk”, almond milk” or “rice milk”.

The composition of milk is vary by season, breed, stage of lactation, feed and health of the cow. All milks contain specific protein like casein, fats, lactose, vitamins and minerals. Lipids are presence in the milk as emulsified globules coated with a membrane, protein as a micelles and most mineral, vitamin and lactose are in dissolved form in the solution. The proximate analysis of sheep goat and cow milk are presented in Table 1.1.

Table 1.1. Proximate Analysis of Milk

| Component        | Sheep | Goat  | Cow   |
|------------------|-------|-------|-------|
| Fat (%)          | 7.1   | 4.1   | 3.8   |
| Protein (%)      | 5.8   | 3.4   | 3.3   |
| Lactose (%)      | 4.6   | 4.6   | 4.7   |
| Ash (%)          | 0.92  | 0.80  | 0.72  |
| Total solids (%) | 18.42 | 12.90 | 12.52 |

Ref : Pond (2004)

The major component of milk is fat, of which 98% of milk fat consists of triglycerides, a molecules constructed of two separate components, glycerol and fatty acid. The fatty acids chain length vary from 4 to 18 carbons. The number of the short chain fatty acid amount is higher compared to the long chain fatty acid. The non polar triglycerides in milk

are packaged in fat globules which contain thousands of triglyceride molecules that coalesce to form a droplet surrounded by polar membrane. The other component is protein, which divided into two major families, casein and whey protein. The caseins make up about 80% of total protein and most of them do not exist in the milk as isolated molecules but aggregate together to form a complex structure called casein micelles.

Milk can be categorized into perishable food because it contains a lot of nutrients that can be used by microorganism to survive and grow. Milk powder processing is one of the preservation method in order to extend the shelf life by reducing the moisture content of the milk so that the free water is no longer exist in a large amount and therefore can't be used by the microorganism. The concept of milk powder processing is to evaporate the water from the milk. The evaporation should be done in hygiene condition with lowest cost, and in the same time minimum cost should be maintained. The milk quality parameters such as nutritional value, color and flavor must be met in order to fulfill consumer acceptance. Another purpose of milk powder processing is to minimize the economical cost by reducing the bulk density of the products; it means that it can save more space during transportation and storage.

Several aspects of milk powder quality are routinely measured to establish the standards that are agreed by both manufacturers and customers. Quality aspects can be classified into four groups: organoleptic, compositional, physical and microbiological quality. Organoleptic quality covers the taste and odor of the powder. The undesirable flavor such as those resulting from oxidation or superheating should be absent or detected in an acceptable level. Other parameters such as titratable acidity and also milk fat and water content must be able to fulfill the quality standard of milk powder. The physical characteristic for example solubility, bulk

density and color are also important. The powder should be free from lumps and exhibit satisfactory flow characteristics. The microbiological quality is a function of quality of the raw material and the level of hygiene during manufacture. Milk should have minimum levels of coliforms, yeasts and moulds and absence of specific groups of bacteria like salmonellae, staphylococci and thermophilics.

PT. Fonterra Brands Manufacturing Indonesia is one of the industry that develop its business in dairy ingredients majorly milk processing such as milk powder, whipped cream, ice cream and cheese. Milk powder like “Anlene” and “Anmum” are the brands that are already widely spread in the market and well known by consumer.

### **1.2. Internship Program Purpose**

The purposes of the internship program in PT. Fonterra Brands Manufacturing Indonesia are:

1. Knowing and understanding dairy ingredients processing including raw material supply and processing into milk powder.
2. Studying some practical problems as well as the problem solving that happen during processing.
3. Learning about quality control management and sanitation during processing.
4. Being familiar to the working environment that will be faced in the future.

### **1.3. Internship Program Method**

The methods that will be used during the internship program in PT. Fonterra Brands Manufacturing Indonesia are direct observation (starting from the company history, organization structure, factory layout, raw

material and packaging supply, sanitation, product quality control and final product storage), interview and also doing literature research.

#### **1.4. Time and Place**

The internship program was done from 4<sup>th</sup> January 2015 until 31<sup>st</sup> January 2016 in PT. Fonterra Brands Manufacturing Indonesia located at KITIC – Delta Mas Kav.55, Central Cikarang, Bekasi District 17330.