CHAPTER I
INTRODUCTION

This chapter contains the background of this final project, problem formulation, the objective of the final project, the scopes of the final project and the outline of writing the final project report.

1.1 Background

Increasing competition in the industrial sectors, making producers have to improve their strategies, company management, and all of the aspects of the production process in the company. The aspects that must exist in an industry to make the production process run well, namely 5M that is man, money, materials, machines, and methods. This causes many industries need to improve the quality of their businesses so that they can still compete with other similar industries. One of the industries that are growing a lot now is an industry that engaged in food processing, such as bread, chips, and also like regional specialties such as rendang and other foods. The bread industry is one of the businesses that is increasing nowadays. According to Maulana (2018) at kontan.co.id, the average growth of bread and cake business in Indonesia rose by 14% in 2010-2014 and it is predicted will be increased in 2014-2020 by 10%. In this case, 60% of which hold this big development is Small, Medium Enterprise (SME) while the rest are large producers and artist producers.

Bread is one type of food that is often consumed by most people in Indonesia as breakfast or snacks. Bread is made from ingredients such as flour, sugar, paste, salt, yeast, emulsifier, milk powder, margarine, and other ingredients. To produce food processing products, of course, they must choose quality raw materials and be carried out with processes and equipment and facilities which of course have been guaranteed with it's hygienic and have good quality. To support the development of a business, facility planning is needed which includes planning the placement of

facilities and the design of facilities needed by the industry. These facilities are not only about production machines but also the tools and equipment, storage for raw materials and finished products and other supporting facilities. The design of the facility includes the design of the facility system, plant layout, and material handling system.

Facility layout can be defined as a collection of physical elements that are regulated according to certain rules or logic (Hadiguna and Setiawan, 2008). Physical elements refer to machinery, equipment, buildings and so on. Rules or logic refers to a set of objective functions such as the total distance or the total cost of material movement. Arrangement of the facilities layout and working areas that exist is a problem that is found in the industry. Inaccurate layout results in an irregular flow of material which causes frequently movements, excessive transportation and also the level of work performance are not optimal.

Winda and Rafi Bakery SME's is a business that is engaged in the food industry, namely bread, and chips. This company is located in Wisma Indah VI Blok G No. 20, Balai Baru, Padang City, West Sumatera. The company which was established in 2013 initially produced *sanjai* chips, but the *sanjai* chips products did not get such a good market response, thus the company developed the business into a bread business. The products offered by this business are bread, consists of some variants, namely Happy Bakery, Ceria Bakery, Sandwich bread. The main products of Winda and Rafi Bakery SME's are variations of Happy Bakery and Ceria Bakery that produced every day while sandwich bread is produced because there are orders every 3 days. The differences between the two main products are the size of the product produced and its color. Besides, the difference between the two products is during the packaging process, which is Ceria Bakery is packaged using a help packaging machine while Happy Bakery is done manually by workers using a sealer tool. Happy Bakery products that have six variant products that are banana chocolate, milk chocolate, choco cheese, cappuccino, coconut, and mung beans, while Ceria Bakery products only have fillings in the form of mung beans.

This product produced by Winda and Rafi Bakery SMEs distributes their product to Padang City and several cities in West Sumatra such as Sijunjung, Batusangkar, Alahan Panjang, Pariaman, Bukittinggi, Lubuk Basung, Pasaman, and Natal. Winda and Rafi Bakery SME's produce about 28,000 products totally per day. To fulfill this production, the company is assisted by 30 employees whose work start from 08.00 WIB to 18.00 WIB or around 10 hours of work. To help the production process, there are several machines used, namely mixing machines, press machines, bread line machines, ovens, and packaging machines. The company has a production area that has size 16.15 m x 14.6 m.

Based on the results of interviews with one of the field supervisors at Winda and Rafi Bakery SMEs, the company plans to increase the production of the company which currently is about 28700 products per day to be about 44700 products per day. This plan aims to fulfill the demand of customers and expand the market of company's products. Therefore, production facilities are needed to support the production process such as equipment used such as baking pan or production machinery so that it can support the achievement of the production target of the company. The following is the number of current production and production targets planned in the future, which can be seen in **Table 1.1.**

Table 1.1. Number of Current Production and Production Targets Planned

Product	**Number of Production per day**	
	Now	**Target Planned**
Ceria Bakery	17000	25500
Happy Bakery	10500	18000
Sandwich Bun	1200	1200
Total	28700	44700

Besides, on the production floor, there are currently some problems which are the flow of material in the production process has an irregular flow and backtrack in mixing department and pressing department as shown in **Figure 1.1**, that does not categorized as a well-plant layout according to Hadiguna and Setiawan (2008), where there should be well-material flow planning so that the material flow

is smooth and there is no backtrack.And also the raw materials are stored on the production floor, which is should be separated and has special storage for it.

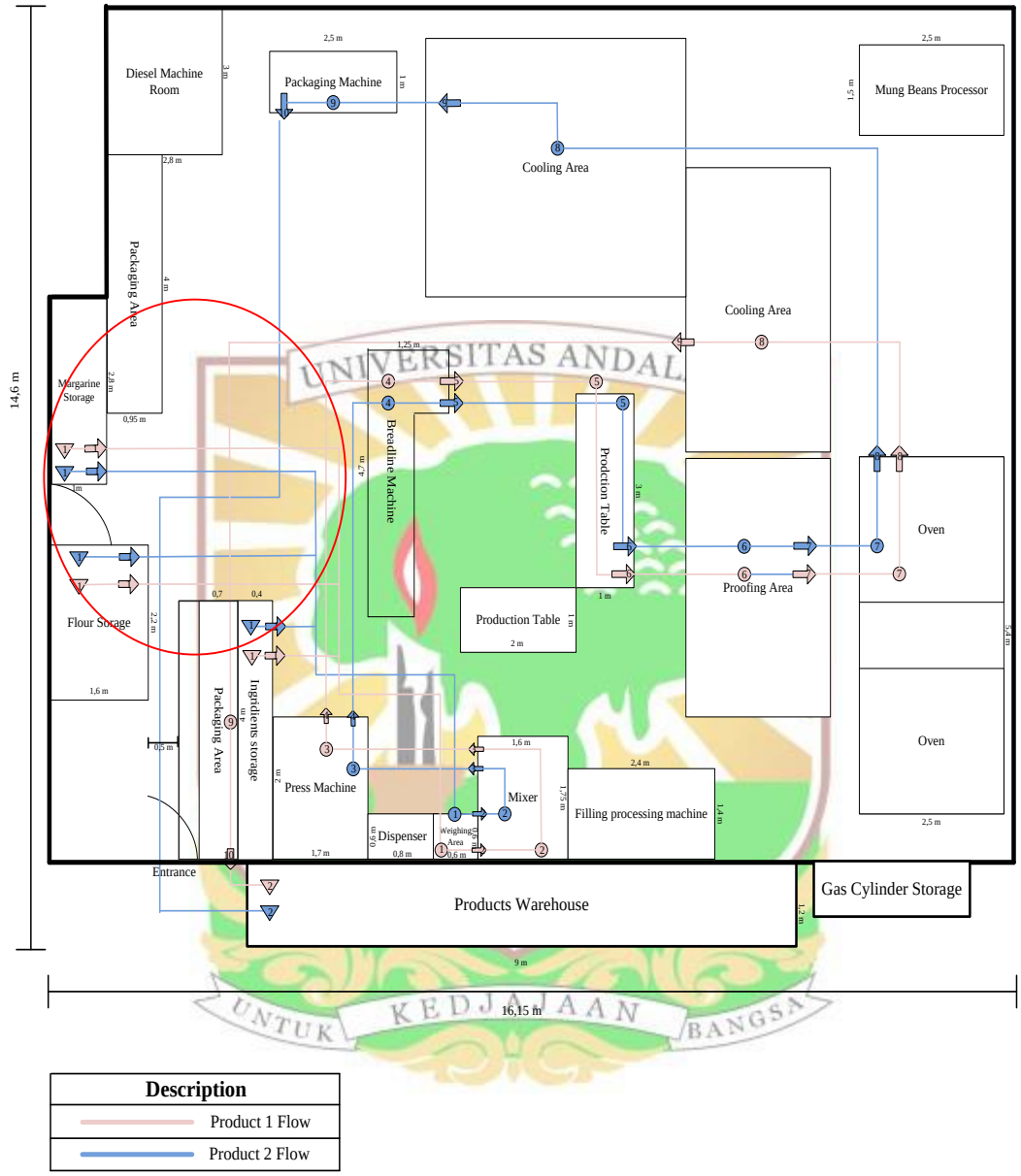

Figure 1.1 Layout and Flow Diagram of Production Area

Another problem that occurs on the production floor is the location of the raw materials storage that closed to the entrance of the production area and also the packaging area that placed in the same area as can be seen in **Figure 1.2** (a). From this figure, it can be seen that the width of space in the entrance only have size of 0.5 m, this condition can disrupt the packaging process when there is a process of

entering raw materials and when workers bring bread out after being packed to the products warehouse. According to Wignjoseobroto (1996), about the standard of aisle width that recommended for lanes that are only traversed by humans without using the material handling is supposed to be have a widht of 1 m. Also, the company has not applied the concept of well-layout characteristics of sufficient storage space, that is, unused equipment or products that have been processed must be stored in good facilities so as not to interfere with other production processes. In this case, the equipment used is left scattered in the production area which will certainly disrupt other processes or the movement of workers. And also sometimes some products that have been packaged are not immediately placed to the warehouse and instead hindered the area of raw material storage which can be seen in **Figure 1.2**(b). From **Figure 1.2** (d), we can see that the gas cylinder used as a fuel for baking is placed near the oven which is a source of thermal. This condition is certainly dangerous because it can cause work accidents such as explosions and even fires.

(a) The condition of the entrance of the production area

(b) A stack of products that have not been moved to the warehouse

(c) A stack of equipment that is not being used

(d) Storage of gas cylinder is near to the oven

Figure 1.2 Problems that occur on the production floor

Based on the explanation above, where the manager has a plan to increase production amount that might have an impact on the number of machine requirement and the condition of the production floor need to repair to improve work productivity so that the final project is needed to assist managers in analyzing and making decisions. The final project that needed to solve the existing problems, is carried out in the form of a design of a layout of the bakery production floor of Winda and Rafi Bakery SME's. The output of this final project is a proposed layout which is expected to be able to become a reference for the manager in making decisions in the future.

1.2 Problem Formulation

Based on the explanation that has been mentioned in the background section, the problems that exist in Winda and Rafi Bakery SME's that can be identified are whether the current production capacity of the company can fulfill the production targets planned by the company. Besides, due to problems in the production floor such as the unsuitable storage of materials and placement of some equipment, it is necessary to design the improvement or doing the re-layout of the production floor in Winda and Rafi Bakery SME's considering the increasing of production amounts.

1.3 Objectives of Research

The objectives of this final project are to designing the layout of the production area at Winda and Rafi Bakery SME's by considering plans to increase the company's production targets.

1.4 Scopes of Research

The scopes of this final project are :

1. The production capacity used for this final project based on the production target capacity decided by the company that is about 44700 products per day.
2. The problem of storage for raw materials and the finished product is not discussed.
3. The improvement cost for the proposed layout is not calculated.

1.5 Outline of The Final Project Report

The outline in report writing for this final project consists of six chapters, as follows:

CHAPTER I: INTRODUCTION

The first chapter of this report contains the background of the final project, problem formulation of this final project, the purpose of the final project, scopes of the final project and outline of writing in this final project.

CHAPTER II: LITERATURE REVIEW

This chapter contains the literature related to the final project conducted, such as the theory about production capacity and facilities layout design.

CHAPTER III: RESEARCH METHODOLOGY

This chapter contains steps doing the final project, starting from the evaluation of actual layout, design a proposed layout with arranging the layout using the product layout approach.

CHAPTER IV: DATA COLLECTION AND DATA PROCESSING

This chapter contains data collection that needed in this final project such as the actual capacity of machines, specification of machines that used in the production process, the actual condition of

production layout, a dimension of facilities, the distance between facilities, operation production time, and materials movements data and also the sequence of the production process.

CHAPTER V: RESULT AND ANALYSIS

This chapter consists of a proposed layout and comparison of the calculation of material handling cost between actual layout and proposed layout for the production area and to make the sensitivity analysis about the proposed layout.

CHAPTER VI: CONCLUSION AND SUGGESTION

This chapter consists of the conclusion of this final project and the suggestions for the future final project.