CHAPTER I INTRODUCTION

I.1 Background

Indonesia has a lot of islands that rounded by the costal along the island. According to statistic of Indonesia (BPS), Indonesia have almost 3,7 million hectares of coconut plant. Not only the quantity, the quality of coconut itself in Indonesia is having a good quality. Because Indonesia is a tropical county so that the coconut will grow well (Kemendag, 2017). Due to high production of coconut product in Indonesia, Indonesia is becoming one of the biggest countries in exporting the coconut product. According to International Coconut Community, total Indonesia has exported 1,093.43 million USD of coconut product. One of the contributors in exporting the coconut product is desiccated coconut with the percentage of 9%. The interest of the desiccated coconut is increasing especially in United States, Europe, and Russia. The market is still growing positively and dynamically (Purba et al., 2021).

CV Una Surya Putra Mandiri is one of the companies that contribute on exporting coconut product. This company is an agricultural production company. This company was found in 2011 and stared businesses as desiccated coconut (DC) manufacturing company for human consumption (DC for food) and for animal feed (DC for feed). CV Una Surya Putra Mandiri has sold their product overseas such as Japan, Korea, Europe, Brazil, Pakistan, China, and middle east. Since Indonesia is known as world's archipelagic country the distribution of the coconut is scattered in several island around Indonesia, the CV Una Surya Putra Mandiri manufacturing facilities are also spread throughout Indonesia close to coconut-producing areas.

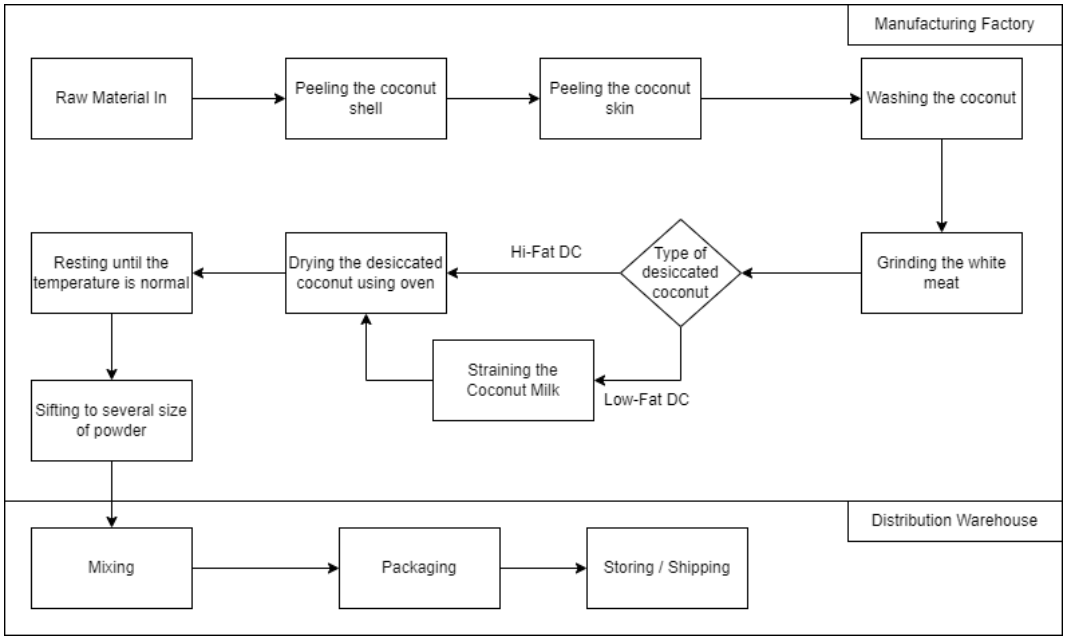

Figure I.1 Production process of desiccated coconut
Source: CV Una Surya Putra

In processing the desiccated coconut, CV Una Surya Putra Mandiri dividing the process into two places such as manufacturing factory and distribution warehouse. In manufacturing factory, the process starts from raw materials continue to peeling the coconut shell and skin. After processing the peeling, next process is washing the coconut. In the middle of the washing process, the coconut will be stored for a minute until the coconut oven is already done in processing previous goods and ready to operate again. Then the coconut that has been washed, go to the grinding and oven for high fat, and for low fat it is go to the grinding, sifting, and oven. Next, the desiccated coconut will be sifting to several size of the product and transferred to distribution warehouse to be mixed and packed then the finished product is stored or shipped.

The manufacturing process of desiccated coconut that produce by CV Una Surya Putra Mandiri is considered as make to stock (MTS) production environment. According to Chapman (2006), Make to stock (MTS) production did not considering the costumer specification that suitable for the desiccated coconut product. In production point of view, make to stock (MTS) production means that the production aiming to be stocked the final product. This makes the Master Production Schedule (MPS) is used for determining the production level to optimize the inventory.

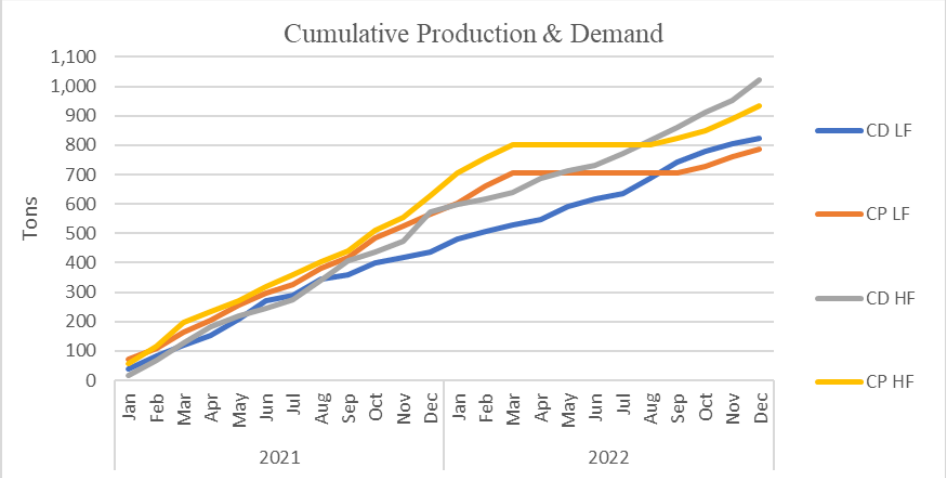

Figure I.2 Cumulative Demand and Production Output
Source: CV Una Surya Putra (2023)

Figure I.2 shows the CV Una Surya Putra Mandiri production output and demand in 2021-2022. The graph shows the production cumulative is starting to increase the gap with the demand cumulative in September 2021. The gap shows the error between the demand and the production output. It is shown in the Table I.1 the error between the demand and production output.

Table I.1 Error demand with production output

Error	**Exiting HF**	**Existing LF**
MSE	759,985,762	591,375,301
MAD	4,520	3,263
MAPE	7.03%	7.53%

According to make to stock production, the error in Table I.1 will impact the inventory. The data of the end inventory for each month can be seen in Figure I.3.

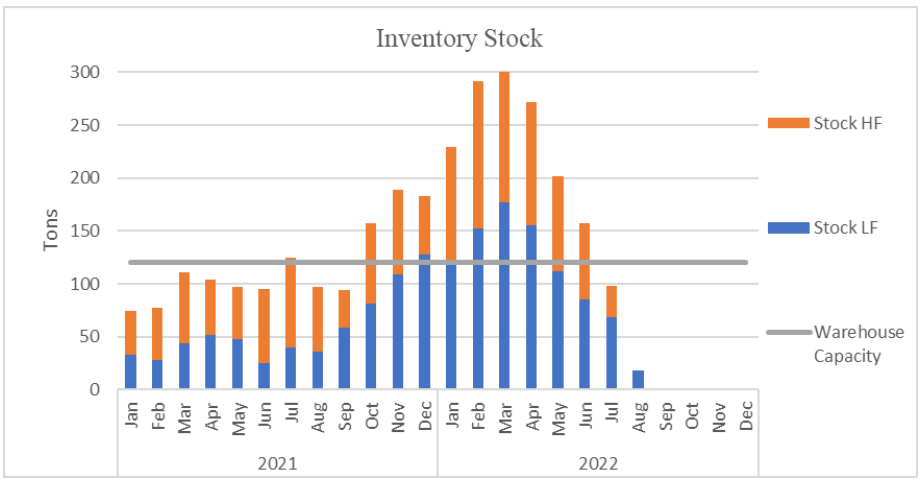

Figure I.3 Finished Good Stock in
Source: CV Una Surya Putra (2023)

Figure I.3, it is show that the inventory cannot hold more stock in October 2021 that they decided to rent another warehouse. In the other hand, in the Figure I.2, the production cumulative is less than the demand cumulative. It is show that at that time the back order is occurred. Table I.2 show the lateness of the shipment.

Table I.2 Export Realization in 2022

Product	Order	Due Date	Shipment Date	Lateness	Quantity (Kgs)
High-Fat	31-Aug-22	20-Sep-22	15-Oct-22	25 Days	25,000
Low-Fat	7-Sep-22	27-Sep-22	10-Oct-22	13 Days	23,000
High-Fat	17-Sep-22	7-Oct-22	29-Oct-22	22 Days	23,000
Low-Fat	20-Sep-22	10-Oct-22	29-Oct-22	19 Days	16,500
High-Fat	28-Sep-22	18-Oct-22	1-Nov-22	14 Days	18,000
Low-Fat	5-Oct-22	25-Oct-22	16-Nov-22	22 Days	16,000
High-Fat	8-Oct-22	28-Oct-22	9-Nov-22	12 Days	25,000
High-Fat	15-Oct-22	4-Nov-22	21-Nov-22	17 Days	26,500
Low-Fat	19-Oct-22	8-Nov-22	30-Nov-22	22 Days	20,065
Low-Fat	10-Nov-22	30-Nov-22	25-Dec-22	25 Days	26,000
High-Fat	15-Nov-22	5-Dec-22	15-Dec-22	10 Days	18,009
High-Fat	27-Nov-22	17-Dec-22	30-Dec-22	13 Days	24,000
Hight-Fat	1-Dec-22	21-Dec-22	unfulfilled	unfulfilled	25,635
High-Fat	10-Dec-22	30-Dec-22	unfulfilled	unfulfilled	18,000
High-Fat	21-Dec-22	10-Jan-23	unfulfilled	unfulfilled	25,000
Total					329,709

Source: CV Una Surya Putra (2023)

Since there are a backorder, it needs to be investigated the production floor. It is known that the machine is idle. The company aimed that the maximum idle time is 15% to minimize the wasting on machine occurred slowly. The Table I.3 is the machine idle time.

Table I.3 Machine Idle Time

Machine	Total working/day (minute)	Machine running	idle time (%)
Grinding the white meat	840	360	57.14%
Straining the Coconut Milk	840	440	47.62%
Drying using Oven	840	840	0.00%
Sifting	840	840	0.00%

It can be concluded that the main problem is that they have uncontrolled production. 5 whys will be used to determine the problem in this research. 5 whys are one of a

method in root cause analysis by asking “why?” or “what cause this problem”. The 5 whys usually take three to five whys, but it can be more than five as long as the root of the causes is obtained (Kane & Kane, 2022). The Figure I.5 shows the 5 whys analysis.

From the 5 Whys method there are some roots of the cause that make the problem. The cause of the overproduction problem there are:

1. Do not prevent the demand fluctuations.
2. Raw material easy to be spoiled.
3. Machine capacity is limited.

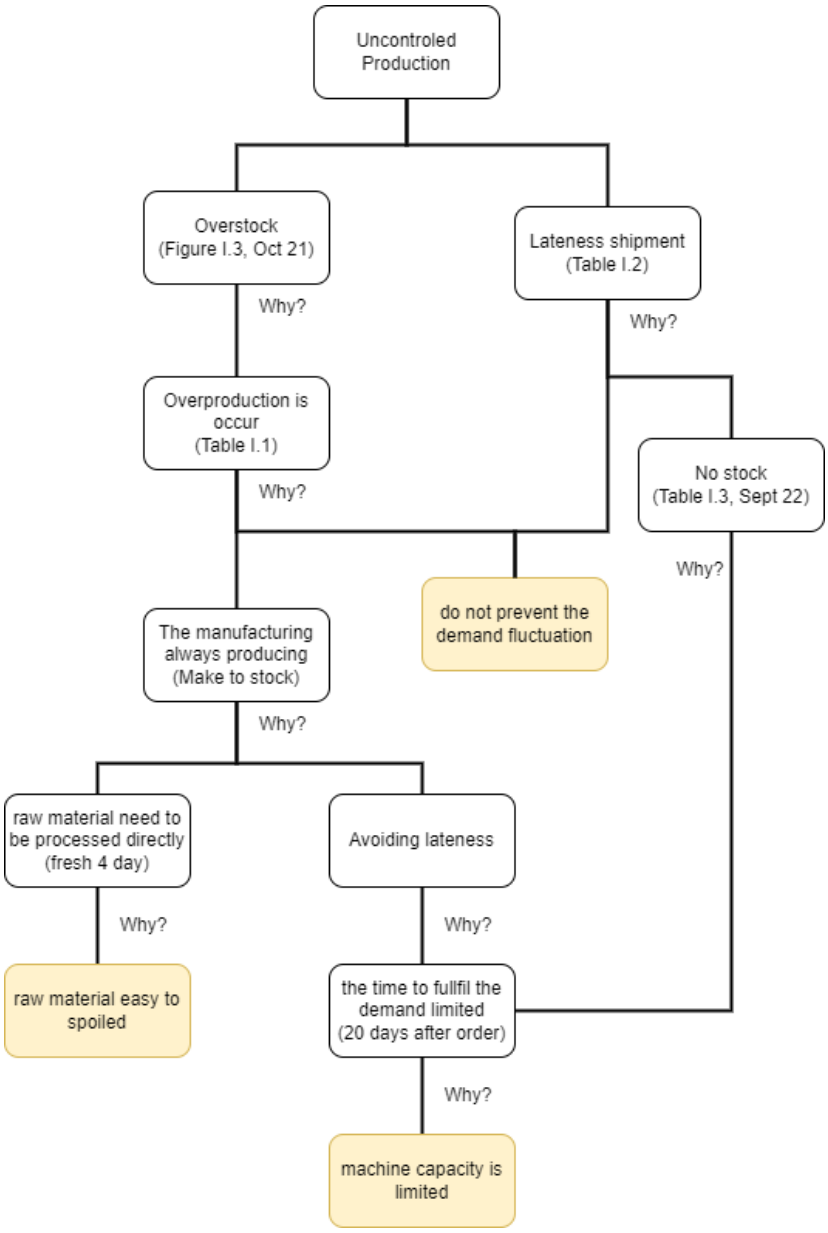

Figure I.4 5 Whys analysis problem in CV. Una Surya Putra Mandiri

After knowing the cause of the problem, there are several alternative solutions to the cause of the overproduction problem that show in the Table I.4.

Table I.4 Root causes and alternative solutions

Root causes	Alternative solution
Do not prevent the demand fluctuations	Forecasting demand can preventing the fluctuation that causes overproduction and underproduction (Kim et al., 2022)
Raw material easy to be spoiled	Determining production, and inventory system for perishable items (Jonrinaldi et al., 2019)
	Determining the optimal storage condition in perishable material (Parmar et al., 2019)
Machine capacity is limited	Rough Cut Capacity Planning as a decision on determine right amount of machine (Sugarindra & Nurdiansyah, 2020)
	Do scheduling to minimizing makespan (Kucukkoc, 2019)

Based on the root causes and alternative solution, the solution is referring to production planning. Production planning is important for manufacturing company to increase the efficiency of the production. Production planning means that determining what, when, and how the product need to be produced. The aim of the production planning is to produce the product to meet the need without excessive inventory or backorder (Sule, 2008).

I.2 Problem Definition

Based on the background above, the problem in this research can be formulated as below:

1. How forecasting demand affects the excessive inventory in producing desiccated coconut in CV. Una Surya Putra Mandiri?
2. How rough-cut capacity planning reducing the cost and preventing backorder in CV. Una Surya Putra Mandiri?
3. How scheduling machine effect desiccated coconut production in CV. Una Surya Putra Mandiri?

I.3 Research Objective

The objectives of the research are:

1. Forecasting demand to prevent the overstock in CV. Una Surya Putra Mandiri.
2. Rough-cut capacity planning to reducing production cost and prevent backorder in CV. Una Surya Putra Mandiri.
3. Effect of machine scheduling to production in CV. Una Surya Putra Mandiri.

I.4 Benefits of Research

The benefits of this research are:

1. This research can provide the production planning in producing desiccated coconut to be implemented in CV. Una Surya Putra Mandiri.
2. This research can provide the implemented of production planning in facing excessive inventory or backorder problem in CV. Una Surya Putra Mandiri.

I.5 Systematics

CHAPTER I INTRODUCTION

This chapter discusses background of the production capacity planning that can be implemented in the company problem. This chapter are issue conceptualization, research objectives, research advantages, and writing systematics.

CHAPTER II LITERATURE STUDY

This chapter includes references to a literature study from past studies relevant to the production planning that exist in this research, as well as the rationale for selecting the method.

CHAPTER III PROBLEM SOLVING METHODOLOGY

This chapter provides a method of the research indicated as a guide for data collecting and processing, the capacity planning, in this study. Also determining the scope of problem and timeline of the research.

CHAPTER IV DATA COLLECTION AND PROCESSING

This chapter provide the data and processing the data into a result using the production planning. The procedure of the collecting data is based on the chapter III.

CHAPTER V RESULT ANALYSIS

This chapter will verify and validate the production planning obtain in chapter IV with the analysis of the solution based on before and after the implementation of the solution by comparing the existing data with the production plan solution.

CHAPTER VI CONCLUSION AND SUGGESTION

This chapter will conclude the results of the solution based on the problem occur in chapter I with the suggestion