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Analysis of Soybean Raw Material Inventory Capacity on Tempeh Production Volume in Sanan Village, Malang City

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INDEXING

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ABSTRACT

Sanan Village in Malang City is known as the center of the tempeh industry, with production reaching 1.8 tons per day. The importance of analyzing the capacity of soybean raw material supplies and its impact on the volume of tempeh production in Sanan Village. This research aims to analyze the current soybean raw material inventory capacity available in Sanan Village, assess the effect of soybean raw material inventory capacity on tempeh production volume at Mrs. Anjarwati's MSME, Sanan Village, recommend strategies to increase soybean raw material inventory capacity in supporting more optimal tempeh production. This research method uses MRP analysis with a research duration of 2 months from December 2024 to January 2025. The results of the study show that the raw material inventory capacity is sufficient, with appropriate stock to support the smooth production of tempeh. Remaining stock if the business manager utilizes raw materials optimally. Based on the MRP analysis, the soybean raw material inventory and supporting the volume of tempeh production by focusing on improving the quality and quality of the tempeh produced. For further researchers, it is hoped that further researchers will study more aspects of the maintenance of the production process, both from machines or tools to produce products and maintenance of the quality of the available raw materials.

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INTRODUCTION

Sanan Village in Malang City is known as the center of the tempeh industry, with production reaching 1.8 tons per day. The challenges that arise in Sanan Village are related to the unstable capacity of soybean raw material supplies which can hinder the production process and product innovation. In addition, researchers see several problems related to production capacity (Gunawan *et al*, 2024). Thus, in-depth research is needed on this problem. Enhancing inventory capacity can be effectively achieved through financial economic improvements, as well as described by Kusufa *et al* (2024).

The importance of analyzing the capacity of soybean raw material supplies and its impact on the volume of tempeh production in Sanan Village. By understanding these dynamics, it is hoped that producers can implement better strategies in inventory management (Gunawan *et al*, 2024) So as not only to increase tempeh production but also to support the economic sustainability of the community in Sanan Village.

Several previous studies have indeed studied the capacity of soybean raw materials, for example, Hulu (2023) that the capacity of soybean raw materials can be increased through policy recommendation efforts and strategic steps to accelerate the fulfillment of domestic soybean supplies to achieve self-sufficiency. On the other hand, researchers (Hulu, 2023) that in 2021, the projection of soybeans produced domestically reached 613.3 thousand tons, down 3.01 percent from 2020 which reached 632.3

thousand tons (Herlina *et al*, 2023). It is estimated that it will continue to fall by 3.05 percent to 594.6 thousand tons in 2022. A year later, soybean production will decrease by 3.09 percent to 576.3 thousand tons. Meanwhile, soybeans originating from Indonesia fell by 3.12 percent to 558.3 thousand tons in 2024 (Hulu and Rahayu, 2024).

LITERATURE REVIEW

Definition of Inventory

Inventory is an activity that is guided by the availability of goods for the needs and smoothness of production in a business, business, or company (Gunawan, 2018). The goods in question are finished goods, goods in process, and raw materials (Singh *et al*, 2021). Finished goods are goods that are ready to be sold, goods in process are goods that are in the process of being made while raw materials are goods that are used in producing more finished goods (Andari, 2016).

Definition of Raw Material

Raw materials are basic materials used in the production process to produce finished goods (Andari, 2016). Raw materials are the main components in making a product and will undergo various stages of processing before becoming finished goods (Kliment *et al*, 2020). Raw materials can be various materials, such as metal, plastic, wood, paper, chemicals, cloth, raw food, and so on depending on the type of product being made (Keskisaari and Kärki, 2017).

Definition of Material Requirement Planning (MRP)

Material Requirement Planning (MRP) is a planning system used in supply chain management to manage a company's inventory and production (Hasanudin *et al*, 2020). MRP helps companies identify the raw material, component, and spare part requirements needed to meet customer demand or to maintain optimal inventory levels (Yimsri *et al*, 2022). Using data on customer demand, production times, and current inventory levels, MRP can produce detailed plans for the procurement and use of these materials. This system helps companies avoid unnecessary excess inventory or shortages of materials that can hinder the production process (Ivanov *et al*, 2021).

RESEARCH METHOD

Data Resources

1. Primary Data
   Primary data refers to information gathered firsthand by researchers during fieldwork, rather than being sourced from others (Gunawan *et al*, 2024). This primary data was obtained from interviews and observations conducted by tempeh craftsmen in the village of Sanan, Malang City.
2. Secondary Data
   Secondary data refers to information acquired indirectly, gathered by researchers based on data collected by others. In this study, secondary data pertains to soybean processing and tempeh production, incorporating statistical data from official institutions and historical data from craftsmen about costs and production outcomes previously recorded.

Method of Collecting Data

1. Observation Method
   This method involves direct observation of the object or phenomenon being studied. Observation provides more accurate data because researchers can record information

in its original context.

2. Interview Method
   Interviews are direct interactions between researchers and respondents to dig deeper into information.

Techniques of Data Analysis

The data analysis technique in this study uses the Material Requirement Planning (MRP) method. Material Requirement Planning (MRP) is a planning system used in supply chain management to manage a company's inventory and production.

RESULTS AND DISCUSSION

A. Data Bill of Material on Mrs. Anjarwati's Micro, Small, and Medium Enterprise (MSME)

Compiling a Bill of Material list includes the components needed in making a product. The following is a table listing the material requirements needed in making tempeh products.

Table 1. Bill of Material Table List of Raw Material Requirements for Mrs. Anjarwati's MSME for the period December 2024 to January 2025

Period : December 2024

No.	Name of Raw Material/Component	Required quantity	Description
1.	Soy	800 Kg	Purchased
2.	Tempeh Yest	8 Kg	Purchased
3.	Water	2.000 Liter	Purchased

***Source**: Processed Primary Data, 2025*

Period : January 2025

No.	Name of Raw Material/Component	Required quantity	Description
1.	Soy	800 Kg	Purchased
2.	Tempeh Yeast	8 Kg	Purchased
3.	Water	2.000 Liter	Purchased

***Source**: Processed Primary Data, 2025*

Based on the table above, data obtained in the field through information from the business owner, it can be seen that in a month there are four tempeh-making processes, each of which is carried out every week. Every week, Mrs. Anjarwati's MSME requires 200 kg of soybean raw materials, 2 kg of tempeh yeast, and 2,000 liters of water to support the smooth running of the production process.

Thus, in one month, the total raw materials used reached 800 kg of soybeans, 8 kg of tempeh yeast, and 8,000 liters of water. The production process which is carried out routinely every week has become an inseparable part since the beginning of Mrs. Anjarwati's MSME, reflecting the sustainability of the business which is carried out with full dedication and high commitment to the quality and quantity of tempeh production produced, as well as ensuring the availability of sufficient stock to meet market demand.

B. Data Master Production Schedule (MPS) on Mrs. Anjarwati's Micro, Small, and Medium Enterprise (MSME)

Master Production Schedule (MPS) is a detailed plan used in production management to determine the amount and schedule of goods production in a certain period. The following is Table 2 Master Production Schedule (MPS).

Table 2. Master Production Schedule (MPS) Table for Mrs. Anjarwati's MSME for the Period December 2024 to January 2025

Period (Month)	Tempe Production Plan (Piece)	Raw Material Requirements		
		Soy (Kg)	Tempeh Yeast (Kg)	Water (Liter)
December 2024	1.200 (Piece)	800 (Kg)	8 (Kg)	2.000 (Liter)
January 2025	1.200 (Piece)	800 (Kg)	8 (Kg)	2.000 (Liter)
TOTAL	2.400 (Piece)	1.600 (Kg)	16 (Kg)	4.000 (Liter)

***Source**: Processed Primary Data, 2025*

From the table above, it can be explained that every 1 month the supply of soybean raw materials from 800 kg of soybeans produces 1,200 pieces of tempeh. Every month, Mrs. Anjarwati's MSME produces 1,200 pieces of tempeh from 800 kg of soybeans, which is the result of four production processes carried out every week. In each weekly process, using 200 kg of soybeans as raw material, Mrs. Anjarwati managed to produce around 300 pieces of tempeh, which shows the efficiency of processing soybeans into quality tempeh. Thus, if calculated as a whole in one month, the use of 800 kg of soybeans can produce a total of 1,200 pieces of tempeh, which are then distributed to consumers, both locally and through other market channels. The production process carried out routinely every week not only reflects the regularity and mature system in business operations but also shows Mrs. Anjarwati's commitment to maintaining the consistency of the quality of the tempeh produced every month while meeting the growing market demand.

CONCLUSION

From the research results, it can be concluded that there are several important points in the analysis of soybean raw material inventory capacity at Mrs. Anjarwati's MSME, Sanan Village that have been obtained, so the following conclusions can be drawn:

1. Mrs. Anjarwati's MSME has sufficient raw material inventory capacity, with appropriate stock to support the smooth production of tempeh.
2. It is important for Mrs. Anjarwati's MSME to make the best use of soybean raw materials and follow the rules that have been set in the raw material processing process.
3. The strategy implemented is to focus on improving the quality of the tempeh produced, which is expected to strengthen business sustainability and maintain consumer satisfaction in a sustainable manner.
4. From the MRP analysis, it is known from the BOM data that the list of raw materials/components needed to produce tempeh are soybeans, tempeh yeast, and water.
5. From the MPS data, a detailed plan is used in production management to determine the amount and schedule of production of goods in a certain period.

The researcher provides the following suggestions:

1. For the owner of the MSME business, Mrs. Anjarwati, in producing tempeh, it is necessary to continue to maintain and improve the quality of the soybean raw materials used, by ensuring that the raw materials received are truly in good condition and meet the established standards, considering that the influence of bad weather can affect the quality of soybeans.
2. For further researchers, it is hoped that further researchers will study more aspects of the maintenance of the production process, both from machines or tools to produce products and maintenance of the quality of the available raw materials.

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