JISS Journal of Indonesian Social Science

Vol. 5, No. 6, June 2024
E-ISSN: 2723-6692
P-ISSN: 2723-6595
http://jiss.publikasiindonesia.id/

Analysis of Raw Material Inventory Control with A Tabular Approach and Formula Approach Economic Order Quantity (EOQ) to Optimize The Cost of Soybean Raw Material Inventory At The Rizqy Putra Fried Tofu Factory

Winarti Shofariah, Faldy Herdian
Universitas Teknologi Digital, Bandung, Indonesia
Email: winarti10120698@digitechuniversity.ac.id, faldyherdian@digitechuniversity.ac.id
Correspondence: winarti10120698@digitechuniversity.ac.id*

KEYWORDS
Raw Material Inventory Control; Formula Approach; Economic Order Quantity (EOQ)

ABSTRACT
Inventory management is a crucial aspect in the operations of the manufacturing industry, including in fried tofu factories such as the Rizqy Putra Fried Tofu Factory. The main raw material, namely soybeans, must be managed efficiently to ensure smooth production and minimize the costs incurred. This research aims to determine the inventory control of soybean raw materials applied by Rizqy Putra Fried Tofu Factory, the total inventory cost, and the optimal quantity of soybean raw material orders. This research is quantitative research with a comparative descriptive analysis. The data processed are the inventory purchase and usage reports of soybean raw materials at Rizqy Putra Fried Tofu Factory in 2023. The data analysis method used in this research includes two approaches: the tabular approach and the formula approach with the calculation technique of Economic Order Quantity (EOQ). Based on the results of the research, the inventory control method applied by Rizqy Putra Fried Tofu Factory is the traditional or conventional method, where the total inventory cost of soybean raw materials is Rp. 18,720,000 with details of storage costs amounting to Rp. 18,000,000 and ordering costs of Rp. 720,000 per year, and an ordering frequency of 48 times with an average order quantity of 5,875 kg. Meanwhile, according to the calculation of the formula approach EOQ, the optimal order quantity is 2,880 kg, with an ordering frequency of 24 times and the total inventory cost incurred is Rp. 734,387. The conclusion of this research indicates that based on the calculation of the EOQ formula approach, the total inventory cost of soybean raw materials is more optimal compared to the conventional method applied by Rizqy Putra Fried Tofu Factory.

1. Introduction

A company is an organization formed by a person or group of people or entities with the aim of producing and distributing goods or services to meet human economic needs. Every company has various goals, including obtaining profits, maintaining a smooth production process, and achieving various other goals (Turnip, 2017). The achievement of these goals is complex and influenced by various factors, such as the smoothness of the production process. One of the key factors in

manufacturing companies is the procurement and control of raw material inventory to ensure the smooth production process which is often referred to as raw material inventory (Anista & Widiyastuti, 2016; Haryadi & Bramasto, 2023a, 2023b).

Inventory is a material or item that is stored for use in achieving a specific purpose, such as in the process of assembly production, resale, or for parts of a piece of equipment or machinery. Inventory can be in the form of raw materials, auxiliary materials, work-in-progress goods, finished goods or spare parts. Herjanto, (2017). Meanwhile, according to Assauri in Arista and Fajrin, (2016) Inventory refers to assets consisting of goods owned by the company with the intention of being sold during a normal business period, or inventory of goods that are still in progress or finished processes, or inventory of raw materials that are waiting to be used in the production process. According to J. Heizer et al., (2015) states that inventory is determining the balance between inventory investment and customer service. Inventory goals will never achieve a low-cost strategy without good inventory management (Akhmad & SE, 2018; Muksin, 2023).

Raw material inventory is unprocessed raw materials provided by the company for further use in the company's production process. Raw materials are very important in manufacturing companies. Limited or oversupply of raw materials can be a problem for the company. Shortage of raw materials can hamper company operations, especially during production, while excess supply of raw materials can cause excessive inventory costs and the value of raw materials will decrease over time (Julyanthry et al., 2020).

Rizqy Putra Fried Tofu Factory is a manufacturing company engaged in the fried tofu making industry. The company is located on Jl. Ciraden Canal Kp. Bojong Cinta Karya (Alam Sanggar Indah) Tanjungwangi Village, Cihampelas District, West Bandung, West Java. This company has the main raw material, namely soybeans. One important factor in the company is the inventory of raw materials as the main source of production that must continue to be done to meet consumers (Sulistyowati & Huda, 2021).

In its activities the company implements a continuous or continuous production process, in which supervision in the production process is carried out thoroughly. This emphasizes the importance of the company to carry out management functions well, especially in control, so that company goals can be achieved. The inventory of raw materials carried out by the Rizqy Putra Fried Tofu Factory has not been optimal, because in its activities the company purchases soybean raw material inventory continuously without estimating production needs. In addition, there is sometimes a shortage of soybean raw materials, caused by delays in delivery. The delay in the delivery of soybean raw materials resulted in the hampering of fried tofu production which affected the profits obtained by the company.

Policies on raw material inventory control applied by companies in making purchases based on experience or observation in warehouses without estimating production needs, often experience problems. The problem that often occurs is the scarcity and increase in soybean prices . Soybeans are the main raw material in making fried tofu, price increases and supply scarcity can disrupt smooth production. In addition, there is a risk of excess stock of raw materials that can lead to an increase in inventory costs. This is because soybean storage is optimal in just a span of one to two months, exceeding this limit can result in quality degradation or even spoilage.

Therefore, the company must control the inventory of soybean raw materials. Controlling raw material inventory is very important to minimize the risk of raw material shortages. To determine the optimal order quantity of soybeans, companies need to implement inventory control methods such as the order economy model. It aims to minimize the total cost of raw material inventory while maximizing profits.

The Economic Order Quantity (EOQ) method is one of the main approaches in inventory management that is well known for its simplicity. Theoretically, the EOQ concept is the most basic

and traditional inventory model. The EOQ model is used to control inventory by ordering raw materials in optimal quantities. By using EOQ, companies can plan the frequency and number of orders for the most economical raw materials in a certain period. The implementation of EOQ helps companies reduce storage costs and ordering costs, as well as overcome problems related to inventory, thereby reducing the risks that may arise due to oversized inventory. This EOQ analysis provides a clear estimate of the frequency and optimal amount of raw material purchases.

So the purpose of this study is to find out how to control the inventory of soybean raw materials applied by the Rizqy Putra Fried Tofu factory, to find out the total cost of soybean raw material inventory if the company establishes an *Economic Order Quantity* (EOQ) method policy, and to find out the number of economical soybean raw material inventory orders after using the *Economic Order Quantity* (EOQ) method.

2. Materials and Methods

Approach and Types of Research

The approach used in this study is a quantitative approach, which is an approach that uses aspects of measurement, calculation, formula, and numerical data in every stage of research, starting from research proposals, research processes, hypotheses, going to the field, data analysis, to writing research reports.

This type of research uses a comparative descriptive method. Descriptive method is a research method that aims to provide a systematic picture of scientific information obtained from the subject or object of research. Descriptive research focuses on systematic explanations of facts discovered during research. The goal is to create a systematic, factual, and accurate description, picture, or painting of the facts, properties, and relationships between the phenomena investigated.

Comparative analysis is a research method that involves collecting, processing, and analyzing various kinds of data with the aim of producing conclusions. The comparative method is used in this study to find out how the comparison of inventory methods between the methods used by factories with the *Economic Order Quantity* method can increase inventory cost efficiency.

Objek Penelitian

In conducting a study, the first thing to pay attention to is the object of research to be studied. Where the object of research contains a problem that will be used as research material to find a solution. The object of research that the author will examine is the Control of Raw Material Inventory at the Rizqy Putra Fried Tofu Factory in Tanjungwangi Village, Cihampelas District, West Bandung Regency.

Data Collection Techniques

The process of research and writing, the author uses data collection methods are as follows:

1. Interviews, in the interview process are carried out with conversations by two parties, namely the interviewer and the interviewee. The interviewee gave answers to questions given by the interviewer related to the issues discussed, which were conducted to the owner of the Fried Tofu factory Rizqy Putra about the supply of raw materials in Tanjungwangi Village, Cihampelas District, West Bandung Regency.
2. Observation, in the observation process, observations are made on ongoing processes or activities, making observations on the raw material control system carried out by the Rizqy Putra Fried Tofu factory in Tanjungwangi Village, Cihampelas District, West Bandung Regency.

Data Analysis Methods

The method of data analysis in this study is divided into two methods, namely::

1. Tabular Approach

This method involves compiling a list or table that contains the order amount and annual fee. The order with the lowest cost will be considered the most economical order.

Table 1 Economical order quantity breakdown

Order Quantity (*order*)	Order Quantity (*order*)	Average setup	Storage costs	Ordering Cost	Total cost/year

2. Formula Approach

In determining the amount of economical orders by mathematical formulas, the focus is on minimizing inventory costs. This can be achieved by paying attention to *the trade-off* between holding costs and *ordering costs*. The mathematical formula that is often used to find the economic order quantity is to use the EOQ (*Economic Order Quantity*) economic model.
In the EOQ model, the number of economic orders (Q) can be calculated using the formula:

$$EOQ = \sqrt{\frac{2.(D).(OC)}{CC}}$$

Information:
EOQ = Optimal number of items per order
D = Annual demand for inventory goods in units (Demand)
OC = Ordering Cost
CC = Carrying Cost

3. Results and Discussions

Basically, inventory management helps optimize the operational processes of manufacturing companies by ensuring the smooth production and distribution process to customers. Each company has a different approach to managing raw material inventory, including determining the amount of raw materials, time of use, and the cost of purchasing raw materials. However, good raw material inventory control is very important for every company to ensure the production process runs smoothly (Novitasari, 2022). Without effective control, the production performance of a factory can be disrupted.

Based on the results of interviews at Rizqy Putra Fried Tofu Factory, inventory control of soybean raw materials is carried out in traditional or conventional ways. The company started by estimating how much soybeans it would need based on previous sales. Then, the company orders soybeans according to production needs and stores them well in warehouses, paying attention to stock rotation to use longer soybeans first. This process is carried out without the use of advanced

technology or information systems. In addition, the company also checks the quality of soybeans received manually. In this way, the company can run fried tofu production smoothly and efficiently even though it uses conventional methods in managing its raw material inventory.

The use of conventional methods in controlling the inventory of soybean raw materials at the Rizqy Putra Fried Tofu Factory often experiences several problems, such as when soybean prices rise which causes production costs or inventory costs to increase significantly. To overcome this problem, companies can consider the application of the EOQ (Economic Order Quantity) method. With the EOQ method, the company will calculate the optimal amount of raw materials that must be ordered each time an order is placed, taking into account the cost of ordering and storage costs. Thus, companies can reduce inventory costs by ordering the right amount according to production needs, thus avoiding excess inventory that has the potential to result in high storage costs. In addition, companies may also consider negotiating better prices with suppliers based on the larger volume of purchases resulting from the implementation of the EOQ method. With this strategy, the company can maintain a balance of production costs and ensure smooth operations even in the face of fluctuations in raw material prices.

Data Analysis

1. Purchase of Raw Materials,

Rizqy Putra Fried Tofu Factory uses a conventional purchasing strategy where the purchase of soybean raw materials is carried out regularly to meet production needs. Soybean purchasing decisions are based on experience from previous periods, adjusted to future production needs. Soybeans are ordered four times a month. Rziqy Putra Fried Tofu Factory uses imported soybeans from America. Until now, the factory has not experienced problems with the quality of soybeans received, because usually, the soybeans purchased are of good quality

Table 2 Soybean Raw Material Purchase Data

No.	Month	Total (kg)
1	January	6.000
2	February	6.000
3	March	5.500
4	April	6.000
5	May	6.500
6	June	5.000
7	July	6.000
8	August	6.000
9	September	5.500
10	October	6.000
11	November	6.000
12	December	6.000
Total		70.500
Average		5.875

Source: Rizqy Putra Fried Tofu Factory

Based on table 2, it can be seen that in January and February Rizqy Putra Fried Tofu Factory purchased 6,000 kg of soybean raw materials, but in March the purchases made decreased to 5,500 kg because there were still remaining supplies of soybean raw materials in the warehouse, then in April soybean purchases became as usual at 6,000 kg, while in May soybean purchases increased to 6,500 kg, then in June soybean purchases decreased dramatically to 5,000 kg, in July and August soybean purchases returned to normal by 6,000 kg, but in September soybean purchases decreased again to 5,500 kg, then soybean purchases in October, November, and December became as usual at 6,000 kg. For a year, Rizqy Putra Fried Tofu Factory purchases a total of 75,000 kg of soybean raw materials, with an average of 5,875 kg.

2. Use of Raw Materials,

The use of soybean raw materials at the Rizqy Putra Fried Tofu Factory in 2023 is 70,000 kg with a frequency of purchases during 2023 48 times a year. Details of the use of soybean raw materials in 2023 are presented in table 3 below:

Table 3 Raw Material Usage Data

No.	Month	Total (kg)
1	January	5.800
2	February	5.400
3	March	5.800
4	April	5.600
5	May	6.000
6	June	5.600
7	July	6.000
8	August	6.000
9	September	5.800
10	October	6.000
11	November	6.000
12	December	6.000
Total		70.000
Rata-rata		5.833

Source: Pabrik Tahu Goreng Rizqy Putra

Based on table 3 above, it shows the use of soybean raw materials at Rizqy Putra Fried Tofu Factory which changes every month. Normally the use of soybean raw materials per month is as much as 6,000 kg. The lowest use of soybean raw materials was in February, which was 5,400 kg. From the data on the use of raw materials above, it shows that the total use of soybean raw materials during 2023 is 70,000 kg.

3. Frekuensi Pemesanan

Order frequency at Rizqy Putra Fried Tofu Factory in table 4*Source:* Rizqy Fried Tofu Factory below:

Table 4 Booking Frequency,

Time Purchase	Frequency of Purchasing Soybean Raw Materials
1 month	4 Kali
1 year	48 Kali

Source*: Rizqy Putra Fried Tofu Factory*

Rizqy Putra Fried Tofu Factory placed orders in one month, which is four times, so that in one year the frequency of ordering soybean raw materials on as many as 48 orders.

4. Ordering Cost

Ordering Cost is the cost of expenses related to the process of ordering goods or materials by the company. This cost is greatly influenced by the frequency of ordering raw materials. Based on the results of the study, it is known that the components of the order costs incurred by the Rizqy Putra Fried Tofu Factory are telephone costs which are credit tariff costs, and SMS costs used for communication with suppliers, and transportation costs or shipping costs. Details of the cost of ordering soybean raw materials at Rizqy Putra Fried Tofu Factory can be seen in Table 5 below:

Table 5 Ordering Cost

No.	Types of Fees	total (Rp.)
1.	Phone charges	Rp. 240.000
2.	Transportation Costs	Rp. 480.000
Total		Rp. 720.000

Source: Rizqy Putra Fried Tofu Factory

Based on table 5 above, it shows the cost of ordering soybean raw materials at the Rizqy Putra Fried Tofu Factory is Rp. 720,000 for one year.

5. Carrying Cost,

Carrying Cost are costs incurred due to the storage of goods in the warehouse. The amount of storage costs is influenced by the amount of raw material inventory. The soybean raw material storage warehouse at Rizqy Putra Fried Tofu Factory is not separated from the production site of making fried tofu. Therefore, the costs incurred for the storage of soybean raw materials are not too high because the warehouse used is relatively simple. The details of the cost of ordering soybean raw materials at the Rizqy Putra Fried Tofu Factory can be seen in table 6 belowi:

Table 6 Carrying Cost

No.	Types of Fees	Total (Rp.)
1.	Electricity Cost	Rp. 3.600.000

2.	Labor Cost	Rp. 14.400.000
Total		Rp. 18.000.000

Source *: Rizqy Putra Fried Tofu Factory*

The total cost of storing soybean raw materials in 2023 is Rp. 18,000,000, which is used for electricity costs and warehouse labor costs at the Rizqy Putra Fried Tofu Factory.

Soybean Raw Material Inventory Control Analysis

Calculations are very important in controlling the inventory of soybean raw materials at the Rizqy Putra Fried Tofu Factory, to be able to minimize inventory costs consisting of ordering costs and storage costs. Therefore, Rizqy Putra Fried Tofu Factory can produce fried tofu according to consumer demand.

1. Tabular Approach

Table 7 Tabular Approach

Order Quantity (*Order*)	Number of Units/*Orders* (kg)	Average Setup (kg)	Booking Fee (Rp)	Storage Cost (Rp)	Total Cost/year (Rp)
1	70.500	35.251	720.000	18.000.000	18.720.000
2	35.250	17.626	1.440.000	9.000.000	10.440.000
3	23.500	11.752	2.160.000	6.000.000	8.160.000
4	17.625	8.815	2.880.000	4.500.000	7.380.000
5	14.100	7.053	3.600.000	3.600.000	7.200.000
6	11.750	5.878	4.320.000	3.000.000	7.320.000
7	10.071	5.039	5.040.000	2.571.429	7.611.429
8	8.813	4.410	5.760.000	2.250.000	8.010.000
9	7.833	3.921	6.480.000	2.000.000	8.480.000
10	7.050	3.530	7.200.000	1.800.000	9.000.000
11	6.409	3.210	7.920.000	1.636.364	9.556.364
12	5.875	2.944	8.640.000	1.500.000	10.140.000
13	5.423	2.718	9.360.000	1.384.615	10.744.615
14	5.036	2.525	10.080.000	1.285.714	11.365.714
15	4.700	2.358	10.800.000	1.200.000	12.000.000
16	4.406	2.211	11.520.000	1.125.000	12.645.000
17	4.147	2.082	12.240.000	1.058.824	13.298.824
18	3.917	1.967	12.960.000	1.000.000	13.960.000
19	3.711	1.865	13.680.000	947.368	14.627.368
20	3.525	1.773	14.400.000	900.000	15.300.000
21	3.357	1.689	15.120.000	857.143	15.977.143
22	3.205	1.613	15.840.000	818.182	16.658.182
23	3.065	1.544	16.560.000	782.609	17.342.609
24	2.938	1.481	17.280.000	750.000	18.030.000
25	2.820	1.423	18.000.000	720.000	18.720.000

26	2.712	1.369	18.720.000	692.308	19.412.308
27	2.611	1.319	19.440.000	666.667	20.106.667
28	2.518	1.273	20.160.000	642.857	20.802.857
29	2.431	1.230	20.880.000	620.690	21.500.690
30	2.350	1.190	21.600.000	600.000	22.200.000
31	2.274	1.153	22.320.000	580.645	22.900.645
32	2.203	1.118	23.040.000	562.500	23.602.500
33	2.136	1.085	23.760.000	545.455	24.305.455
34	2.074	1.054	24.480.000	529.412	25.009.412
35	2.014	1.025	25.200.000	514.286	25.714.286
36	1.958	997	25.920.000	500.000	26.420.000
37	1.905	971	26.640.000	486.486	27.126.486
38	1.855	947	27.360.000	473.684	27.833.684
39	1.808	923	28.080.000	461.538	28.541.538
40	1.763	901	28.800.000	450.000	29.250.000
41	1.720	880	29.520.000	439.024	29.959.024
42	1.679	860	30.240.000	428.571	30.668.571
43	1.640	841	30.960.000	418.605	31.378.605
44	1.602	823	31.680.000	409.091	32.089.091
45	1.567	806	32.400.000	400.000	32.800.000
46	1.533	789	33.120.000	382.979	33.502.979
47	1.500	774	33.840.000	382.979	34.222.979
48	1.469	758	34.560.000	375.000	34.935.000
Total	**314.345**	**157.761**	**846.720.000**	**80.250.024**	**926.970.024**

Source: Processed Researchers (2024)

Based on table 7 above using the tabular approach shows the lowest total inventory cost, which occurs when the frequency is 5 times with the number of orders as much as 14,100 kg, the average inventory is 7,053 kg. The order cost incurred is Rp. 3,600,000 and storage costs are Rp. 3,600,000 so that the total inventory costs incurred are Rp. 7,200,000.

Calculation of Number of Bookings:

$$\text{Number of units/orders} = \frac{Total\ Raw\ material\ requirements\ per\ year}{Ordering\ frequency}$$

$$\text{Number of units/orders} = \frac{70.500\ kg}{5\ kali}$$

= 14.100 kg

Ordering cost Calculation:

Ordering cost = Total ordering cost X ordering frequency

Ordering cost = Rp. 720.000 X 5
= Rp. 3.600.000

Storage Cost Calculation:

Storage costs = $\frac{Total\ strage\ per\ year}{Ordering\ frequency}$

Booking fee = $\frac{Rp.18.000.000}{5\ kali}$

= Rp. 3.600.000

Then the total cost of inventory with the tabular approach inventory model is:

Total inventory cost = Order fee + Storage fee
= 3.600.000 + 3.600.000
= 7.200.0000

Inventory costs with the policy implemented by Rizqy Putra Fried Tofu Factory, with a total order frequency of 48 times a year, the total amount of inventory is 314,345 kg per year, the average inventory in a year is 157,761 kg, with order costs incurred of Rp. 846,720,000, in a frequency of 48 orders and storage costs of Rp. 80,250,024. So that the total cost of soybean raw material inventory at Rizqy Putra Fried Tofu Factory is Rp. 926,970,024 per year.

The *tabular approach* produces the lowest total inventory cost when the number of ordering and storage costs is the same amount, which is at a frequency of 5 orders per year.

2. *Formula Approach*

The determination of the economical order quantity can be simplified in a mathematical formula by noting that the minimum inventory cost occurs when the order cost equals the storage cost.

1) *Economic Order Quantity* Method

Based on the results of the study, it show that the application of the EOQ method can optimize inventory costs at Rizqy Putra Fried Tofu Factory, which in turn can increase profitability. However, before determining the optimal number of orders in each order, it is necessary to pay attention to the basic steps on which the calculation of EOQ is based, namely the period during which prices remain stable, both for the purchase of raw materials and the cost of ordering and storage. In addition, it requires constant availability of funds to make purchases at all times, assuming stable use of materials over time. Ensure that raw materials are always available on the market and adequate storage facilities are available, taking into account that they are not easily damaged when stored in warehouses.

Analysis is used to determine the number of orders that can optimize inventory costs, Rizqy Putra Fried Tofu Factory can use the *Economic Order Quantity* (EOQ) method. With the EOQ method, it can be known the number of economical soybean raw material orders that must be made at the time of purchase.

According to Rizqy Putra Fried Tofu Factory, the total purchase of soybean raw materials issued in 2023 is 70,500 kg with a frequency of 48 orders a year or four times a month. The amount of raw

materials used is 70,000 kg in 2023. The order fee incurred is Rp. 720,000 and the storage fee is Rp. 18,000,000 in 2023.

The calculation to calculate the cost of ordering soybean raw materials is as follows:

$$\text{Cost per message} = \frac{Total\ booking\ cost}{Booking\ Frequency}$$

$$= \frac{\text{Rp.720.000}}{\text{48 kali}}$$

$$= \text{Rp. 15.000}$$

It is known that the total order cost incurred by Rizqy Putra Fried Tofu Factory is Rp. 720,000, with a frequency of ordering 48 times a year. Based on the calculation above, the cost of ordering soybean raw materials is Rp. 15,000 for each order.

The calculation for calculating the storage cost of soybean raw materials is as follows:

$$\text{Storage Cost} = \frac{Total\ storage\ cost}{Total \text{ of raw material inventory}}$$

$$= \frac{\text{Rp. 18.000.000}}{\text{70.500 kg}}$$

$$= \text{Rp. 255}$$

The calculation to calculate the number of economical orders using the EOQ method is as follows:

Economic *Order Quantity Calculation*:

$$\text{EOQ} = \sqrt{\frac{2.(D).(OC)}{CC}}$$

$$\text{EOQ} = \sqrt{\frac{2.(70.500).(15.000)}{255}}$$

$$\text{EOQ} = \sqrt{\frac{(141.000).(15.000)}{255}}$$

$$\text{EOQ} = \sqrt{\frac{2.115.000.000}{255}}$$

$$\text{EOQ} = \sqrt{8.294.118}$$

EOQ = 2.880 Kg

Based on data obtained from Rizqy Putra Fried Tofu Factory, the purchase of soybean raw materials is as much as 70,500 kg. from calculations using the *Economic Order Quantity* (EOQ) method, it is obtained that the number of orders for soybean raw materials that can be ordered is as much as 2,880 kg so that the costs incurred are more economical.

The calculation for the average inventory of soybean raw materials in a year that can be done by Rizqy Putra Fried Tofu Factory is:

$$\text{Average setup} = \frac{Q*}{2}$$

$$= \frac{2.880 \text{ kg}}{2}$$

$$= 1.440 \text{ kg}$$

It is known that the purchase obtained from the calculation with the *Economic Order Quantity* (EOQ) method is as much as 2,880 kg, so that the calculation above shows the average inventory of soybean raw materials which is as much as 1,440 kg.

Calculation To calculate the number of order frequencies estimated in each message using the *Economic Order Quantity* (EOQ) method is:

Estimated booking frequency = $\frac{D}{Q*}$

$$F = \frac{70.500 \text{ kg}}{2.880\ kg}$$

$$F = 24 \text{ times}$$

It is known that the need for soybean raw materials at the Rizqy Putra Fried Tofu Factory is 70,500 kg, with an economical order amount obtained using the *Economic Order Quantity* (EOQ) method of 2,880 kg. Based on the results of research conducted at Rizqy Putra Fried Tofu Factory, the frequency of ordering from the calculation above using the EOQ method shows that the frequency that can be done by Rizqy Putra Fried Tofu Factory is 24 times a year. Meanwhile, what is done by Rizqy Putra Fried Tofu Factory is 48 times a year. So that Rizqy Putra Fried Tofu Factory can minimize the frequency of ordering soybean raw materials.

Calculation to calculate the annual booking fee using the EOQ method:

Booking fee = $\frac{D}{Q*}\ x\ s$

$$= \frac{70.500\ kg}{2.880\ kg}\ x\ Rp.15.000/pemesanan$$

$$= \text{ Rp. } 367.187 \text{ / year}$$

It is known that the need for soybean raw materials is 70,500 kg, with the number of economical orders obtained by calculating the *Economic Order Quantity* (EOQ) method of 2,880 kg, and the cost of each order is Rp. Rp. 15,000. Based on the calculation above, the amount of order costs that can be incurred by Rizqy Putra Fried Tofu Factory is Rp. 367,187 for orders per year.

Calculation to calculate annual storage costs using the EOQ method:

Storage costs = $\frac{Q*}{2}\ x\ H$

$$= \frac{2.880\ kg}{2}\ x\ Rp.\ 255/kg$$

$$= \text{ Rp. } 367.200 \text{ / year}$$

It is known that the number of economical orders obtained using the *Economic Order Quantity* (EOQ) method is 2,880 kg, and the storage cost per kg is Rp. 255 kg. Based on the calculation above, the amount of storage costs that can be incurred by Rizqy Putra Fried Tofu Factory is Rp. 367,200 per year.

Discussion

Based on the analysis of the inventory model, it can be seen that the *tabular approach* shows the lowest amount of inventory costs at a frequency of 5 times, with a large number of unit inventory / order orders of 14,100 with an average inventory of 7,053 kg, storage costs and order costs of Rp. 3,600,000, so that inventory costs incurred are Rp. 7,200,000.

In the calculation model with a *formula approach approach* , economic orders are obtained using the *Economic Order Quantity* (EOQ) method, which shows many units / orders of 2,880 kg, with an average inventory of 1,440 kg. Based on the frequency calculation in the *Economic Order Quantity* (EOQ) method, the number of orders that are estimated to be made is 24 times. The cost of ordering in the preparation model using the *Economic Order Quantity* (EOQ) method shows the total cost incurred is Rp. 367,187 / year. While the storage costs incurred are Rp. 367,200 / year, so that the total inventory costs incurred are Rp. 734,387 / year.

Based on the inventory model above, the calculation with the *Economic Order Quantity* (EOQ) approach formula approach, can be better to apply because in the *Economic Order Quantity* (EOQ) method, order costs and storage costs have decreased, so as to minimize the costs incurred by the Rizqy Putra Fried Tofu Factory and can maximize the profits obtained.

4. Conclusion

Based on the results of research and discussion in the previous chapter, a conclusion can be drawn as follows: Based on the results of an interview with the Rizqy Putra Fried Tofu Factory, it can be seen that the control of soybean raw material inventory carried out by the company is only by conducting warehouse observations or can be called conventional methods. Based on the calculation of the inventory model with the Economic Order Quantity (EOQ) approach formula, it can be seen that the total inventory cost that must be incurred by the Rizqy Putra Fried Tofu Factory is Rp. 734,387 / year with a frequency of ordering 24 times a year, meaning it is very economical compared to the inventory costs incurred so far by the Rizqy Putra Fried Tofu Factory with a frequency of orders made 48 times a year. Based on the calculation of the inventory model with the Economic Order Quantity (EOQ) approach formula approach, it shows an economical order quantity of 2,880 kg, can reduce order costs and storage costs, so as to minimize inventory costs incurred at the Rizqy Putra Fried Tofu Factory and can maximize the profits obtained.

5. References

Akhmad, D., & SE, M. (2018). Manajemen Operasi (Teori dan Aplikasi dalam Dunia Bisnis). *Bogor: Azkiya Publishing*.

Anista, T., & Widiyastuti, T. (2016). Analisis pengelolaan persediaan bahan baku untuk meningkatkan produksi guna memenuhi permintaan konsumen pada UD Nanda Putri Srengat Blitar. *Jurnal Penelitian Manajemen Terapan (PENATARAN)*, *1*(1), 92–103.

Assauri, S. (2012). *Manajemen Pemasaran: Vol. Cetakan Kesepuluh*. Rajawali Pers.

Assauri, S. (2019). *Manajemen Produksi dan Operasi*. Lembaga penerbit Fakultas Ekonomi Universitas Indonesia.

Fajrin, E. H., & Slamet, A. (2016). Analisis Pengendalian Pesediaan Bahan Baku dengan Menggunakan Metode Economic Order Quantity (EOQ) pada Perusahaan Roti Bonansa. *Management Analysis Journal*, *4*(5).

Haryadi, D., & Bramasto, A. (2023a). Study of Inventory Control and Quality Control of Raw Materials. *Almana: Jurnal Manajemen Dan Bisnis*, *7*(3), 613–621.

Haryadi, D., & Bramasto, A. (2023b). Study of Inventory Control and Quality Control of Raw Materials. *Almana: Jurnal Manajemen Dan Bisnis*, *7*(3), 613–621.

Heizer, J. D. (2015). *Manajemen Operasi: Manajemen Keberlangsungan dan Rantai Pasokan* (Edisi 11). Salemba Empat.

Heizer, J., Render, B., & Munson, C. (2020). *Operations Management: Sustainability and Supply Chain Management*. Pearson Education London.

Herjanto, E. (2017). *Manajemen Operasi: Vol. Cetakan ke 7* (Edisi Ke 3). PT. Gramedia.

Julyanthry, J., Siagian, V., Asmeati, A., Hasibuan, A., Simanullang, R., Pandarangga, A. P., Purba, S., Purba, B., Pintauli, R. F., Rahmadana, M. F., & Syukriah M, E. A. (2020). *Manajemen Produksi dan Operasi: Vol. Cet 1*. Kita Menulis.

Muksin, M. (2023). Economic Order Quantity (EOQ) Application to Raw Material Inventory Control for SME's. *Community Service Journal (CSJ)*, *5*(2), 88–98.

Novitasari, D. (2022). *Manajemen Operasi Konsep dan Esensi*. STIE Widya Wiwaha.

Sulistyowati, K. D., & Huda, I. U. (2021). Analisis Pengendalian Persediaan pada PT. Bima (Berkah Industri Mesin ANGKAT) Cabang Banjarmasin . *JIEB: Jurnal Ilmiah Ekonomi Bisnis*, *7*(3), 430–440. https://ejournal.stiepancasetia.ac.id/jieb/article/view/666/461

Turnip, M. S. K. (2017). Analisis Perbandingan Persediaan Bahan Baku Methanol antara Pendekatan Model Economic Order Quantity dengan Just Time pada CV Mamabros Servicindo Batam. *Ournal of Applied Managerial Accounting*, *1*(2), 1–15.