International Journal of Economics, Business and Accounting Research (IJEBAR)
Peer Reviewed – International Journal
Vol-7, Issue-1, 2023 (IJEBAR)
E-ISSN: 2614-1280 P-ISSN 2622-4771
https://jurnal.stie-aas.ac.id/index.php/IJEBAR

COMPARATIVE ANALYSIS OF ECONOMIC ORDER QUANTITY (EOQ) AND JUST IN TIME (JIT) METHODS ON SUPPLY CONTROL OF PURE COCONUT WATER IN UD. MITRA NATA PERDANA IN MALANG CITY

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Abstract: The main problem in raw material inventory control is the importance of determining the right amount of inventory so that excess or shortage of inventory does not occur. If there is too much inventory, the company will incur large holding and ordering costs, and if it is too little, production will be hampered and the company will lose resources. Therefore, it is necessary to plan and control inventory so as not to affect company profits. The purpose of this study was to determine the calculation and comparison of raw material inventory control using the Economic Order Quantity (EOQ) and Just In Time (JIT) methods at UD. Mitra Nata Perdana in the city of Malang. This type of research is a comparative research that compares the Economic Order Quantity (EOQ) method with the Just In Time (JIT) method for the efficiency of inventory costs at UD. Mitra Nata Perdana in the city of Malang. Data collection techniques with observation, interviews, and documentation. The results showed that there were significant differences between the use of the EOQ and JIT methods in raw material inventory control. From the results of the analysis and calculations that have been done it is known that UD. Mitra Nata Perdana is more effective in using the EOQ method. This is due to the characteristics and production requirements used by UD. Mitra Nata Perdana in the city of Malang.

Keywords: *Inventory Control, Raw Materials, Economic Order Quantity (EOQ), Just In Time (JIT), Effectiveness.*

1. Introduction

In a company, the production process is classified as an important activity for the survival of the company. Good production activities require a balance between several factors. Factors of production are all things that are used in the creation of goods, such as raw materials, machines, capital, and human resources. Especially raw materials which are the main or important thing, because the supply of raw materials is the main component for smooth production (Gunawan et al., 2016).

The importance of determining the amount of raw material inventory of a company, because inventory has an impact on company profits. If there is a mistake in determining the amount of inventory, it can reduce company profits. For example, the inventory of raw materials in a company is carried out in too large an amount (over stock), then there is a high probability that the company will experience some losses. Losses that occur such as the company will bear increasing storage costs (carrying costs), inventory will be damaged if stored for too long in the warehouse, and the company will have to bear ordering costs

(ordering costs) which are quite large, because the purchase of raw material inventory exceeds the number of company needs. . From some of these losses, the company's profits can be reduced. Vice versa, the amount of raw material inventory that is too small (out of stock) also has an impact on the company, such as delays in the smooth production process because the company's operations cannot run optimally and cause the company's resources to be unemployed so that the company can experience losses, by Therefore it is necessary to plan and control so that there is no excess or shortage of raw material supplies (Turnip et al., 2017).

Inventory is fulfilling the demand for products or services from internal and external sources which is carried out by storing company resources as a form of anticipation (Pradana et al., 2020). Inventory control is a company technique in determining inventory optimization levels in the form of physical value and economic value (Lahu et al., 2017).

From some of these explanations it can be concluded that inventory control is an act of planning in production in order to control inventory so that it can determine when and how many efficient production orders are carried out and can minimize the costs that will be incurred.

Addressing some of the problems related to raw material inventory control, there are several methods so that a production process can run smoothly and the costs incurred are smaller. One method that is popular and more often used in companies, among others, is the economic order quantity model, the Economic Order Quantity (EOQ) method and the Just In Time (JIT) method.

The Economic Order Quantity (EOQ) method is the most economical purchase amount for each purchase or order. According to (Gusniar et al., 2022) states that the Economic Order Quantity (EOQ) method is an inventory control technique by minimizing the total cost of ordering and storage. Meanwhile, the Just In Time (JIT) method is an inventory management system where raw materials are not taken directly from the warehouse but are brought in from suppliers when raw materials are needed. Apart from that, there are also those who say that the Just In Time (JIT) method tries to keep the company from having zero or zero inventory. According to (Simanjuntak et al., 2017) states that the Just In Time (JIT) method will only order supplies and carry out the production process when receiving product orders from customers, because this inventory equals zero.

In this study, researchers discuss the economics of the Economic Order Quantity (EOQ) method and the Just In Time (JIT) method because in general a company uses a lot of EOQ and JIT methods. The Economic Order Quantity (EOQ) method has the concept of purchasing raw materials again if the stock of raw materials in the warehouse is running low, while the concept of purchasing raw materials with the Just In Time (JIT) method is not having raw material inventories in the warehouse or raw material supplies are the same with zero.

Researchers are interested in conducting research at UD. Mitra Nata Perdana which is an individual business entity or commonly called a trading business (UD) which is engaged in industrial business in producing nata de coco with pure coconut water as the basic raw material. UD. Mitra Nata Perdana itself usually produces the raw material for pure coconut water to become nata de coco every day. This company has a business activity, namely storing nata de coco in a warehouse while the raw material for pure coconut water is purchased every day. UD. Mitra Nata Perdana is a growing business founded in 2003 by Mr. Samingun and located on Jl. Kendedes, Tulas Besar Village, Tumpang District, Malang City, East Java.

So far, supplies and the accompanying costs have not been a concern for UD. Prime Partners. This is due to ignorance and lack of information that there are solutions to minimize production costs, one of which is to control inventory costs. The problems faced by UD. Mitra Nata Perdana is the purchase of the main raw material, namely virgin coconut water, in quantities that are always greater than the amount of production needed.

The purpose of this study was to determine the calculation and comparison of raw material inventory control using the Economic Order Quantity (EOQ) and Just In Time (JIT) methods at UD. Mitra Nata Perdana in the city of Malang.

2. Research Method

2.1 Research Scope

This research was conducted at UD. Mitra Nata Perdana which is an individual business entity or commonly called UD which is engaged in industrial business in producing nata de coco with the basic raw material of pure coconut water. UD. Mitra Nata Perdana itself usually produces the raw material for pure coconut water to become nata de coco every day. This company has a business activity, namely storing nata de coco in a warehouse while the raw material for pure coconut water is purchased every day. UD. Mitra Nata Perdana is located on Jl. Kendedes, Tulas Besar Village, Tumpang District, Malang City, East Java.

2.2 Types of Research

This research is classified as a type of comparative analysis research with a quantitative approach. Comparative research is research by comparing the conditions of one or more variables in two or more different samples or two different times based on studies (Sugiyono et al., 2018). In this study, researchers compared the Economic Order Quantity (EOQ) and Just In Time (JIT) inventory control methods which would then be analyzed and compared the results in terms of minimizing inventory costs and the risk of loss due to the procurement of raw materials and to find out which method is most appropriate and efficient in implementing raw material inventory control for UD. Mitra Nata Perdana in the city of Malang.

2.3 Data analysis method

In this study, there are 2 (two) analytical methods used, namely the Economic Order Quantity (EOQ) method and the Just in Time (JIT) method.

A. Citing a study from (Maharani et al., 2015) the calculation of the Economic Order Quantity (EOQ) method can be formulated as follows:

1. Calculation of EOQ and Total Inventory Cost

The formula used to determine the EOQ value is:

$$\sqrt{\frac{2 \times D \times S}{H}}$$

The formula for determining the total cost of inventory is:

$$TIC = \frac{D}{Q} \times S + \frac{Q}{2} \times H$$

Information :

Q* = Quantity Optimal
TIC = Total Inventory Cost
D = Demand
S = Cost Of Ordering

H = Cost Of Holding

2. Calculation of Safety Stock

Safety stock is held to anticipate the occurrence of stockouts in the company's inventory control. When inventory runs out, it results in lost sales to the company. Safety stock can be formulated as follows:

$$SS = Z \times \sigma$$

$$\sigma = 2\frac{\overline{3(5-\bar{5})^9}}{n}$$

Information :
SS = Safety Stock
σ = Standard Deviation of demand during lead time
Z = Safety factor
n = Amount of data
x = Amount of material needed
$\bar{x}$ = Average material requirements

3. Calculation of Reorder Point (ROP)

Reorder Point is the right time for a company to re-order the supplies needed so that the goods can arrive on time. Reorder point can be formulated as follows:

ROP = SS (Lx d)

Information :
ROP = Reorder point
d = Number of needs per day
L = Lead Time
SS = Sfety Stock

4. Maximum Inventory Calculation

Maximum inventory is the limit for the largest amount of inventory in the warehouse. This is necessary so that there is no accumulation of inventory in the warehouse so that there is no wastage of the company's working capital. The amount of maximum inventory can be determined by the formula:

$$Maximum\ Inventory\ (\text{MI}) = Safety\ Stock + EOQ$$

Information :
SS = Safety stock

EOQ = Optimal purchase amount

B. According to (Nuryani et al., 2021) the calculation of the Just in Time (JIT) method can be formulated as follows:

1. Calculation of the minimum order quantity

$$Q* = 2\frac{\overline{/ R S R T}}{U}$$

Information :
Q* = Order quantity at minimum cost in units
D = Total material requirement in one year
O = The cost of ordering each time an order
C = Storage fee per unit

2. Calculation of the minimum total annual cost

$$\boldsymbol{T*} = \frac{\boldsymbol{CD*}}{\boldsymbol{2}} + \frac{\boldsymbol{OD}}{\boldsymbol{Q*}}$$

Information :
T* = Minimum total annual fee

3. Calculation of the optimal number of shipments each time you order

$$\pi\alpha \ \frac{*\,\hat{}*}{/\mathrm{Ra}} - 2$$

Information :
$\pi\alpha$ = The optimal number of shipments with the targeted average inventory level
α = Specific inventory target average in units

4. Calculation of the order quantity for each order

$$Qn = \sqrt{\pi\alpha} \times Q*$$

Information :
Qn = JIT order quantity in units

5. Calculation of the optimal delivery quantity for each time

$$q = \frac{Q\pi}{\pi\alpha}$$

Information :
q = Optimum shipping quantity

6. Calculating the frequency of purchasing auxiliary raw materials

$$\pi = \frac{D}{Q\pi}$$

Information :
π = The optimal number of shipments for one year

7. Calculating the total cost of inventory using the Just In Time (JIT) method

$$Tjit = \frac{g}{\sqrt{\pi}}\{T*\}$$

Information :
T*jit* = Minimum total annual fee for the Just In Time (JIT) method

3. Results and Discussion

3.1 Research data

The following is the data used by the researcher as a basis for discussion and analysis of this data including purchasing, usage, ordering and storage data at UD. Mitra Nata Perdana in the city of Malang.

Table 1
Order Quantity and Average Inventory Level
UD. Mitra Nata Perdana In 2022

No	Month	Initial inventory	Purchase	Total Beginning Inventory	Usage (D)	Final Inventory	Average
		Liter	Liter	Liter	Liter	Liter	Liter
1	January	1400	4000	5400	2799	2601	4001
2	February	2601	3600	6201	2798	3403	4802
3	March	3403	3000	6403	3260	3143	4773
4	April	3143	2500	5643	4414	1229	3436
5	May	1229	4600	5829	3100	2729	4279
6	June	2729	1000	3729	345	3384	3557
7	July	3384	2000	5384	4186	1198	3291
8	August	1198	4000	5198	3462	1736	3467
9	September	1736	4000	5736	4232	1504	3620
10	October	1504	4000	5504	4672	832	3168
11	November	832	5000	5832	3426	2406	4119
12	December	2406	5000	7406	4578	2828	5117
Amount		25565	42700	68265	41272	26993	47630
Average month		2130	3558	5689	3439	2249	3969
Average day		88	147	235	142	93	164

Source: Primary Data UD. Mitra Nata Perdana 2022

Based on table 1, it can be seen that the initial supply for 2022 for raw coconut water is 1400 liters. The initial inventory is the ending inventory at the end of the December 2021 period. The amount of pure coconut water used as raw material issued by UD. Mitra Nata Perdana in 2022 is 41272 Liters with an average consumption per month (24x a month using pure coconut water as raw material) of 3439 and an average daily usage (290 days according to company working hours) of 142 liters.

The average supply level for 2022 for raw coconut water is 3969 liters. To find out the average inventory level, it can be done by dividing the average results from the sum of the total initial inventory and the total ending inventory divided by two.

UD. Mitra Nata Perdana purchases pure coconut water raw materials requiring ordering or purchasing costs. The cost of the order includes transportation costs and telephone costs. Order raw materials for pure coconut water every day.

Table 2
Order Costs Each Time You Order Raw Materials in 2021

Raw Material	Information	Total Order Cost Per Month	Total Order Cost Per Year	Cost Per Message	
				(S)	
				$\frac{Total\ cost\ per\ year}{Order\ frequency}$	
Pure Coconut Water	Call and SMS costs	Rp 50,000	Rp 600,000	Rp	2,069
	Fuel oil	Rp 150,000	Rp 1,800,000	Rp	6,207
Total Cost Per Message (S)				**Rp**	**8,276**

Source: Primary Data UD. Mitra Nata Perdana 2022

Based on table 2, it can be seen that with the ordering costs incurred by UD. Mitra Nata Perdanan which includes a telephone fee of Rp. 50000 per month and fuel costs of Rp. 150,000 per month. It was found that the cost of ordering each time a message was Rp. 8,276.

UD. Mitra Nata Perdana in storing nata de coco raw materials requires a storage fee which includes a monthly electricity fee of Rp. 200,000 and a monthly building maintenance fee of Rp. 50,000.

Table 3
Raw Material Storage Costs in 2022

Raw Material	Information	Monthly Savings Total Per Cost	Total Cost Save Per Year	Messaging Fees
				(H)
				Total Cost Per Year / Number of Needs
Pure Coconut Water	Electricity cost	Rp 200,000	Rp 2,400,000	Rp 58
	Warehouse Maintenance / Repair Costs	Rp 50,000	Rp 600,000	Rp 15
Total Cost Save Per Liters (H)				**Rp 73**

Source: Primary Data UD. Mitra Nata Perdana 2022

Based on the table above, it can be seen that the electricity cost per year is Rp. 2,400,000 with the use of raw materials of 41,272 liters so that it can be seen that the cost of electricity per liter is Rp. 58 and the cost of maintaining or repairing the warehouse per year is Rp. 600,000 with the use of raw materials of 41,272 liters so that it can be seen that the cost of electricity per liter is Rp. 15. Thus, it can be concluded that the total cost of storing pure coconut water per liter is Rp. 73.

The needs issued by UD Mitra Nata Perdana in purchasing the use of raw material supplies can be seen in the table below:

Table 4
Raw Material Needs for UD Mitra Nata Perdana in 2021

Raw Material	Raw Material Needs Per Year (Liters)	Price Per Liter	Order Frequency (times)
Pure Coconut Water	41272	Rp 13,000	290

Source: Primary Data UD. Mitra Nata Perdana 2022

Based on the table above, it can be seen that the raw material requirement for pure coconut water per year is 41,272 liters with a price per liter of Rp. 13,000 and the order frequency is 290 times.

3.2 Hasil Analisis

The results of the analysis in this study are processing the data in table 1 to table 4 using the EOQ and JIT formulas, but previously it is necessary to calculate the number of orders for raw materials and the total cost based on company policy.

1. Analysis of UD. Mitra Nata Perdana Raw Material Inventory Control Based on Company Policy for 2022.

Table 5
Calculation of Order Amount According to Company Policy

Raw Material	Raw Material Needs Per Year (Liters)	Frequency (Times)	Average Amount Per Message (Liters)
	(D)	(f)	Q = D/f
Pure Coconut Water	41272	290	142

Source: Data processed 2023

Based on table 5, it can be seen that the raw material requirement for pure coconut water in 2022 is 41,272 liters with a frequency of 290 orders made by the company, so that the number of orders according to company policy (Q) can be calculated as 142 liters.

Table 6
Calculation of Total Inventory Cost According to Company Policy

Raw Material	Total Order Cost $\frac{D}{Q} \times S$	Total Storage Fee $\frac{Q}{2} \times H$	Total Inventory Cost $n\frac{D}{Q} \times So + (\frac{Q}{2} \times H)$
Pure Coconut Water	Rp 2,400,000	Rp 5,172	Rp 2,405,172

Source: Data processed, 2023

Based on table 6, it can be seen that the total costs to be borne by UD. Mitra Nata Perdana to procure pure coconut water supplies based on company policy of Rp. 2,405,172.

2. Analysis of Raw Material Inventory Control at UD Mitra Nata Perdana with the EOQ Method for 2022.
   a. Economic Purchase Quantity and Total Cost of Raw Material Inventories

Table 7
Calculation of Number of Orders According to the EOQ Method

Raw	Raw Material	Storage Cost	Order Fee	Order Amount (Liters)	Frequency

Material	Needs per Year (Liters)	per Liter			(times)
	(D)	(H)	(S)	$EOQ = \sqrt{\frac{2 \times D \times S}{H}}$	$f = \frac{D}{EOQ}$
Pure Coconut Water	41272	Rp 73	Rp 8,276	3066	13

Source: Data processed 2023

Based on table 7, it can be seen that the number of purchases of pure coconut water raw materials that are economical each time an order is based on the EOQ method is 3,066 liters with a purchase frequency of 13 times.

Table 8
Calculation of Total Inventory Cost (TIC) According to the EOQ Method

Raw Material	Total Order Cost	Total Storage Fee	Total Iventory Cost
	D/EOQ*S	EOQ/2*H	(D/EOQ*S) + (EOQ/2*H)
Pure Coconut Water	Rp 111,405	Rp 111,909	Rp 223,314

Source: Data processed 2023

Based on table 8, it can be seen that the total cost of inventory is obtained from the sum of the total ordering costs and the total storage costs so that the total cost of pure coconut water raw material supplies is Rp. 223,314.

b. Determination of Safety Stock

Table 9
Calculation of Standard Deviation

No	Month	Raw material requirements (x)	$\bar{x}$	$(x-\bar{x})$	$(x-\bar{x})^2$
1	January	2799	3439	-640	410027
2	February	2798	3439	-641	411308
3	March	3260	3439	-179	32160
4	April	4414	3439	975	949975
5	May	3100	3439	-339	115147
6	June	345	3439	-3094	9574899
7	July	4186	3439	747	557511
8	August	3462	3439	23	514
9	September	4232	3439	793	628320
10	October	4672	3439	1233	1519467
11	November	3426	3439	-13	178
12	December	4578	3439	1139	1296562
	Amount	41272			15496069

Source: Data processed 2023

Assuming that the company's management uses two standard deviations or five percent as the tolerance limit for acceptable deviations, and by using one side of the normal

curve (which has a value of 1.65 where this value can be seen in the normal curve area table). Then the calculation of the amount of safety stock is as follows.

Calculation of the standard deviation as follows:

$$\sigma = \sqrt{\frac{\sum(x-x)^2}{n}}$$

$$\sigma = \sqrt{\frac{15496069}{12}}$$

$$\sigma = 1136$$

Once the standard deviation is known, the safety stock can be calculated as follows:

$$SS = \sigma \times 1{,}65$$
$$= 1136 \times 1{,}65$$
$$= 1875 \text{ liter}$$

Based on the above calculation, the safety stock for raw coconut water that must be available in the warehouse is 1875 liters.

c. Reorder Fee (Reorder Point)

Table 10
Calculation of Reorder Points

Raw material	D (Liter)	d (Per day)	Lead Time (Day)	Safety Stock (Liter)	ROP (Liter)
		D / 290			SS + (Lead Time x d)
Pure Coconut Water	41272	142	1	1875	2017

Source: Processed data 2023

Based on Table 10, it can be seen that the amount of raw materials needed per day (d) is obtained from annual requests (D) divided by the working days of UD Mitra Nata Perdana for a year, namely 290 days, it can be calculated that UD Mitra Nata Perdana in 2022 must place an order back when the raw material for pure coconut water was 2017 liters remaining.

d. Calculation Maximum Inventory

Table 11
Calculation of Maximum Inventory

Raw Material	*Safety Stock* (Liter)	EOQ (Liter)	*Maximum Inventory* (Liter)
			EOQ + Safety Stock
Pure Coconut Water	1875	3066	4941

Source: Processed data 2023

Based on Table 11, it can be seen that the maximum amount of raw coconut water that can be stored in a warehouse is 4,941 liters.

3. Analysis of UD Mitra Nata Perdana Raw Material Inventory Control with the JIT Method in 2022
   a. Determining the Optimal Delivery Amount of Raw Materials and the Total Cost of Raw Material Inventory

Table 12
Optimal Delivery Amount of Raw Materials

Raw Material	Optimal Order Quantity (EOQ)	Average Amount of Inventory	Order Frequency	Average Target Inventory	Optimal Number of Shipments (Times)
	(Q*)	(f)		a = Average Stock Quantity / Order Frequency	na = $(Q^*/2a)^2$
Pure Coconut Water	3066	47630	290	164	87

Source: Processed data 2023

Based on Table 12, it is known that the optimal number of raw material shipments for pure coconut water is 87 times for each order.

Table 13
Calculation of Total Inventory Costs According to the JIT Method

Raw Material	Optimal Number of Shipments (Times)	Total Inventory Cost		Total Inventory Cost (JIT)
	(na)		(T*)	$Tjit = \frac{1}{\sqrt{na}}(T*)$
Pure Coconut Water	87	Rp	223,314	Rp 23,925

Source: Processed data 2023

Based on table 13, it can be seen that the total cost of inventory that will be incurred by the company if using the JIT method for pure coconut water raw materials is Rp. 23,925 this cost is much more economical when compared to the cost of inventory using the EOQ method.

b. Determine the Optimal Raw Material Order Quantity

Table 14
Raw Material Order Quantity

Raw Material	Optimal Number of Shipments (Times)	Optimal Order Quantity (EOQ)	JIT Optimum Order Quantity
	(na)	(Q*)	$Qn = \sqrt{na} \times Q*$
Pure Coconut Water	87	3066	28618

Source: Processed data 2023

Based on table 14, the optimal order quantity using the JIT method to meet the raw material needs for virgin coconut water is 517 liters.

c. Determining the Optimal Shipping Quantity For Every Time a Raw Material Shipment

Table 15
Optimal Order Quantity For Each Shipment

Raw Material	Optimal Order Quantity	Optimal Shipping Amount	Optimal Order Quantity Each Time Send
	(Qn)	(na)	$a = \frac{Qn}{na}$
Pure Coconut Water	28.618	87	328

Source: Processed data 2023

Based on table 15, it can be seen that to fulfill an order for pure coconut water raw materials of 28,618 liters for each order, then for each delivery of pure coconut water the optimal raw material is 328 liters.

d. Menentukan Frekuensi Pemesanan Bahan Baku

Tabel 16
Frekuensi Pemesanan Bahan Baku

Raw Material	Raw Material Needs per Year	Optimal Order Quantity	Purchase Frequency
	(D)	(Qn)	N = D/Qn
Pure Coconut Water	41272	28618	1.44

Source: Processed data 2023

Based on table 16, it can be seen that the optimal number of orders for Pure Coconut Water is 1.44 times to meet the demand for raw material for Pure Coconut Water 41,272 liters.

Table 17
Comparison of Total Inventory Cost between EOQ and JIT Methods

Information	Raw material	Company policy	EOQ method	JIT method
Total Biaya Persediaan	Pure Coconut Water	Rp 2,405,172	Rp 223,314	Rp 23,925

Source: Processed data 2023

Table 17 shows a comparison of raw material inventory control for pure coconut water between the policies used by UD Mitra Nata Perdana with the Economic Order Quantity (EOQ) method and the Just In Time (JIT) method. The total inventory costs incurred based on company policy for pure coconut water raw materials amounted to IDR 2,405,172. When using the EOQ method, the total raw material supply for pure coconut water is Rp. 223,314 Meanwhile, using the JIT method, the total cost of raw material for pure coconut water is 23,925.

Table 18
Comparison of Inventory Control between EOQ and JIT Methods

Information	Company policy	EOQ method	JIT method

Raw material requirements per year	41272	41272	41272
Optimum ordering quantity	142	3066	28618
Order frequency per year	290	13	1.442
Delivery frequency per message	1	1	87
Delivery frequency per year	290	13	126
Total Inventory Cost	Rp. 2,405,172	Rp. 223,314	Rp. 23,925

Source: Data processed 2023

Based on table 18, it can be seen that the total cost of inventory if using the JIT method can be lower, because the frequency of orders per year for raw coconut water is made 2 times per year with the frequency of sending each order 87 times so that the frequency of delivery per year is 126 times. Even though more shipments were made than the EOQ method, the total cost of inventory was still lower because the costs incurred for ordering costs were only IDR 8,276. Whereas the EOQ method with less frequency of shipments per year than the JIT method requires a larger total inventory cost than the JIT method, because the EOQ method accumulates goods in warehouses where the storage cost per liter is quite expensive, amounting to Rp. 73 for pure coconut water raw materials.

However, the JIT method is not suitable for UD. Mitra Nata Perdana because if you use the JIT method with a long production time in the production of nata de coco with pure coconut water as a raw material it involves a fermentation process that takes quite a long time, which is around 5-7 days. This may be difficult to achieve in a JIT context, where production must be carried out quickly and on time to meet customer demand and raw material supplies are unstable because the raw materials used to make nata de coco such as pure coconut water and sap liquid may not always be available. available stably and subject to significant price fluctuations which can make it difficult for UD. Mitra Nata Perdana to obtain raw materials according to the strict production schedule required in the JIT method. If using the EOQ method, the total cost of inventory incurred is already lower than company policy and the optimal order quantity is below the maximum inventory and has the availability of storage space with a maximum inventory of pure coconut water raw material of 4,941 liters, while the optimal order quantity is for coconut water raw material pure amount of 3066 liters, which means that the supply of raw materials is sufficient to be stored in the UD warehouse. Mitra Nata Perdana in the city of Malang.

4. Conclusion

Based on the calculation results, it is known that the Economic Order Quantity (EOQ) and Just In Time (JIT) methods are more efficient in calculating the total cost of inventory compared to the method currently used by UD. Mitra Nata Perdana can minimize inventory expenses that must be incurred by the company. From the results of the calculation analysis it is known that inventory cost control is most optimal if UD. Mitra Nata Perdana uses the EOQ method.

1. Calculation of inventory control based on the Economic Order Quantity (EOQ) method for inventory cost efficiency is more optimal than company policy.
2. Inventory control calculations based on the Economic Order Quantity (EOQ) method for inventory cost efficiency are more optimal than company policies and the Just In Time (JIT) method.
3. From a comparison of the two methods, it can be seen that the calculation of inventory control using the Economic Order Quantity (EOQ) method of raw material inventory costs is not significantly different compared to the Just In Time (JIT) method because the JIT method emphasizes zero inventories.) this is why the JIT method cannot be applied because with a long production process to produce nata de coco with raw coconut water, it is anticipated that it will be subject to fluctuations and based on the characteristics of the raw material, it is not recommended to apply the JIT method. While the Economic Order Quantity (EOQ) method has the availability of storage space with a maximum inventory of virgin coconut water raw material of 4,941 liters, while the optimal ordering quantity for pure coconut water raw material is 3066 liters. because if UD. Mitra Nata Perdana has adequate storage space, so EOQ can help companies to optimize inventory availability. In EOQ, companies must order the right amount of inventory at the right time, and avoid wasting inventory, so UD. Nata Perdana partners are advised to apply the EOQ method.

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