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ANALYSIS OF RAW MATERIAL INVENTORY CONTROL FOR RUMINANT FEED AT PT ANDINI MEGAH SEJAHTERA, BOYOLALI REGENCY, CENTRA JAVA

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Abstract. Feed is a vital requirement as a means of livestock production to obtain nutrients in the development process. This study aims to analyze the optimal ruminant feed concentrate raw material inventory, reorder point, safety stock and analyze the comparison of the total cost of concentrate feed inventory before and after using the Economic Order Quantity (EOQ) method at PT. Andini Megah Sejahtera. The research method used is a case study. Data analysis is done by quantitative analysis calculating the optimal raw material inventory through the EOQ method, then comparing with actual conditions and calculating the cost efficiency value of raw material inventory. The results showed that the average order quantity of the most optimal and economical raw material was 351 tons with an average order frequency of 6 times a year. The average amount of safety stock is 235.17 tons and the reorder point is 626.86 tons. A significant difference can be seen between the company's actual total inventory cost and the total inventory cost using the EOQ method. Inventory calculations using the EOQ method can achieve an average inventory cost efficiency of 92% with an average savings of IDR 36,551,229,547 per year. The total inventory cost based on the actual conditions of the company is on average Rp39,194,917,257 greater than using the EOQ method with an average of IDR 643,687,710 per year.

Keywords: Concentrate feed, Economic order quantity, Reorder point, Safety stock

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INTRODUCTION

Meat consumption in Indonesia is projected to continue to increase every year. The Statistics Indonesia (BPS) reported that beef consumption in 2023 increased by 8.20% compared with the previous four years. Domestic beef production has not yet been able to meet national demand, supplying only about 73.98% of total needs, while the remaining 26.06% is fulfilled through imports

(Jiuhardi, 2016). Most livestock farmers face challenges related to access to feed that meets livestock nutritional standards. Consequently, farmers often rely on feed that is easily acquired as well as affordable. These issues are influenced by several factors, including the limited availability of high quality feed, poor livestock management, feed resource constraints, and high feed prices.

Feed is a vital need for the sustainability of livestock businesses. The nutritional content of the feed must meet dietary requirements to support animal growth and productivity. Feed provision must also be efficient, as feed costs represent the largest cost component, accounting for 60%–80% of total livestock production costs (Tondok, 2019). As livestock weight increases, feed requirements also rise until the animal reach certain age when growth ceases. Feed consumption is influenced by several factors, including genetics, feed type, temperature and humidity, and environmental conditions. Feed digestibility is partly determined by the proportion of forage and concentrate feed. Forage typically accounts for about 80% of total feed and contains relatively high crude fiber, which slows feed passage through the digestive tract and supports optimal digestion. Lower crude fiber levels increase the risk of digestive disorders (Akbar et al., 2024). Moreover, insufficient concentrate feeding may lead to energy and protein deficiencies, resulting in weight loss and poor animal health. Conversely, excessive concentrated feeding can cause digestive disturbances and increase feeding costs without proportional production gains.

PT. Andini Megah Sejahtera is a company specializing in the production of concentrate feed for ruminants. The company is located in Kebonbimo Village, Boyolali District, Boyolali Regency, Central Java. Its concentrate production is intended for beef cattle fattening, dairy production, and other ruminants such as sheep and goats. The company focuses on producing high quality feed to meet livestock nutritional needs, particularly in Java, and is committed to providing quality concentrates to help farmers improve productivity. Fluctuating demand for concentrate feed over time affects production processes and the quantity of key raw materials (rice bran, coffee husk, and oil palm kernel) that must be prepared. These raw materials are seasonal, with periods of abundant availability and periods of scarcity, which in turn affects procurement costs. The considerable distance between raw material sources and the company creates lead times between ordering and delivery, making accurate ordering plans essential to avoid production disruptions. Maintaining consistency in meeting consumer demand is a critical responsibility that influences customer satisfaction and loyalty. Peak demand during certain periods leads to increased market demand and higher production volumes.

Based on those issues, an appropriate assessment and calculation are required for the company to implement effective raw material inventory control so that production stability can be maintained and cost efficiency achieved. Inventory management is necessary to regulate raw material levels so that they are neither excessive nor insufficient during production and to ensure smooth distribution in accordance with targets and customer demand (Laoli et al., 2022). An analysis of inventory control for key raw materials (rice bran, coffee husk, and oil palm kernel) used in concentrate feed production is essential to enable the company to meet demand while minimizing inventory related costs and maximizing profit.

This study aims to (1) analyze the optimal quantity of key raw material inventory (rice bran and coffee husk) for concentrate feed at the company, (2) analyze efficient Safety Stock, Reorder Point, and Total Inventory Cost for these raw materials, and (3) compare the Economic Order Quantity (EOQ) method results with the company's actual inventory practices. The study provides more comprehensive and integrated calculations across inventory parameters and includes a direct comparison with the company's actual conditions to illustrate overall efficiency. It also presents a comparison between actual costs and EOQ costs to demonstrate tangible financial impacts. The selection of a case study in the ruminant feed industry based on local raw materials in Kabupaten Boyolali—a dairy farming center known as the "Dairy City" of Central Java—remains relatively limited in prior research. The findings are expected to serve as a guideline for optimizing raw material inventory management and as an academic reference for the development of inventory management knowledge, particularly in livestock feed industries based on local resources.

METHOD

The research on raw material inventory was conducted from October to November 2024 at PT. Andini Megah Sejahtera, a company producing concentrate feed for ruminant livestock. The company operates in Kebonbimo Village, Boyolali District, which is administratively located in Boyolali Regency, Central Java. The research location was selected purposively, meaning it was chosen based on specific considerations. The company distributes its products nationally, covering Sumatra, Java, and Bali. Approximately 15–20 types of raw materials are required to produce ruminant concentrate feed. The large number of inputs necessitates effective production planning to control inventory and prevent overstocking or shortages. The research employed a case study method, defined as an in-depth examination of a particular event or phenomenon within a specific context to understand why it occurs (Fitrah, 2018). The case examined in this study is related to the increase of feed prices in Indonesia by about 30%, from Rp 6,000–7,000 per kg to Rp 9,000–9,500 per kg. Rising feed prices increase production costs for farmers, and if sustained, will also lead to higher prices for livestock products such as meat, milk, and other outputs.

Data were collected through observation, interviews, and documentation. The data sources consisted of primary and secondary data. Primary data were obtained through direct participatory observation of production processes. Secondary data were obtained from company records, including costs and usage of raw materials, inventory levels, and other costs arising from procurement activities. Data analysis employed both descriptive and quantitative methods. The study focused on analyzing the three raw materials with the highest composition values: rice bran, coffee husk, and oil palm kernel. Each raw material was analyzed using Economic Order Quantity (EOQ), Safety Stock (SS), Reorder Point (ROP), Maximum Inventory (MI), Total Inventory Cost (TIC), and cost efficiency calculations. The first objective was analyzed quantitatively by determining the optimal inventory level for each raw material using the EOQ method. The second objective was analyzed by calculating the reorder point, safety stock, and efficient holding costs applicable to the company. The third objective was analyzed by comparing the optimal inventory results derived from EOQ with the company's actual inventory calculations. The analytical tools used are as follows:

1. Econimic Order Quantity (EOQ)
   EOQ is calculation of the optimal quantity of raw materials to order each time with minimum cost (Heizer & Render, 2015).

$$\mathrm{EOQ} = \sqrt{\frac{2\mathrm{SD}}{\mathrm{H}}} \qquad (1)$$

   Where:
   EOQ = Optimal purchase quantity of key raw materials namely rice bran, coffee husk, oil palm kernel (tons)
   S = Ordering cost per order (IDR)
   D = Annual usage of key raw materials, namely rice bran, coffee husk, and oil palm kernel (tons)
   H = Storage cost of key raw materials, namely rice bran, coffee husk, and oil palm kernel (IDR)

2. Safety Stock
   Safety stock refers to the provision of reserve inventory of raw materials maintained to protect inventory levels and ensure the continuity of the company's production process (Herjanto, 2025).

Safety Stock = Z. q

$$q = \frac{\sqrt{(\sum X - Y)^2}}{n} \quad (2)$$

Where:
Z = Error square
q = Standard deviation
X = Actual usage of key raw materials namely rice bran, coffee husk, and oil palm kernel (tons)
Y = Average usage of key raw materials namely rice bran, coffee husk, and oil palm kernel (tons)
n = Number of observations

3. Maximum Inventory
Maximum inventory represents the maximum capacity that can be stored in the warehouse to avoid overstocking or shortages and to achieve cost efficiency (Herjanto, 2015).

Maximum Inventory = Safety Stock + EOQ (3)

4. Reorder Point
Reorder point is used to determine when the company should place a new order for raw materials so as to prevent delays in the arrival of supplies (Herjanto, 2025).

Reorder Point (ROP) = (AU x LT) + SS (4)

Where:
AU = Average concentrate sales during lead time (units)
LT = Lead time (days, weeks, or months)
SS = Safety stock (tons)

5. Total Inventory Cost
Total inventory cost represents the total expenditure incurred to manage inventory optimally.

TIC = Procurement Cost + Storage Cost

TIC = (Q x X) + (Q xY) (5)

Where:
TIC= Total cost of key raw materials namely rice bran, coffee husk, and oil palm kernel (IDR)
Q = Order quantity of key raw materials namely rice bran, coffee husk, and oil palm kernel per order (tons)
X = Procurement cost of key raw materials namely rice bran, coffee husk, and oil palm kernel per order (IDR)
Y = Storage cost of key raw materials namely rice bran, coffee husk, and oil palm kernel per order (IDR)

6. Cost Efficiency
Cost efficiency is calculated as the difference between TIC before applying EOQ and TIC after applying EOQ.
Cost Efficiency = TIC before EOQ − TIC after EOQ

$$\text{Cost Efficiency} = [(Q_1\ X) + (Q_1 \times Y)] - [(Q_2 \times X) + (Q_2 \times Y)]$$

$$\text{Efficiency Value} = \frac{\text{TIC Actual Method - TIC EOQ Method}}{\text{TIC Actual Method}} \times 100\% \qquad (6)$$

Where:

EOQ = Economic order quantity per order (tons)
TIC = Total Inventory Cost (IDR)
Q_1 = Actual order quantity (tons)
Q_2 = EOQ order quantity (tons)
X = Procurement cost of key raw materials namely rice bran, coffee husk, and oil palm kernel per order (IDR)
Y = Storage cost of key raw materials namely rice bran, coffee husk, and oil palm kernel per order (IDR).

RESULT AND DISCUSSION

Procurement of Raw Materials

PT. Andini Megah Sejahtera is capable of producing 800 tons of concentrate feed per month, with an average daily production of 30 tons. Production is carried out based on incoming order, meaning it follows a Make To Order (MTO) system. The main raw materials—rice bran, coffee husk, and oil palm kernel—are obtained through partnerships with suppliers. Cooperation contracts with suppliers facilitate raw material continuity and allow the company to obtain lower prices. The company requires at least 10–11 types of raw materials to produce concentrate feed, and the number of materials used varies depending on the type of product which will be produced (ordered).

Procurement of the main raw materials (rice bran, coffee husk, and oil palm kernel) is still conducted conventionally and based on estimates and experience of the previous years. The company has not yet implemented calculations that optimize ordering and storage costs. Purchases are determined by estimating the amount of orderred raw materials based on warehouse capacity, production needs, and remaining stock. The main raw material requirements for producing concentrate feed are presented in Table 1.

Table 1. Main raw materials of PT Andini Megah Sejahtera

No	Type of Raw Material	Composition Percentage	Material Requirement	Ordering Frequency
		-- %/tons--	--tons/day--	--days--
1	Rice bran	38.00	11.40	every 1 – 2
2	Coffee husk	22.55	6.77	every 2 – 3
3	Oil palm kernel	13.00	3.90	every 5 – 6

Source: Primary Data, 2024

This study focuses on the three primary raw materials as the study object, namely rice bran, coffee husk, and oil palm kernel. Those three raw materials are chosen as the study object because they have the highest composition values in the formulation of concentrate feed produced by the company. Procurement is adjusted to production needs since each material has a different usage percentage. Ordering frequency is also adjusted to production requirements and warehouse capacity. Ordering frequency is employed to achieve optimal ordering and prevent excessive inventory costs.

Actual Usage and Purchase of Raw Materials

Upon arrival at the company, ordered raw materials undergo inspection based on color, odor, texture, and moisture content (maximum 10%). In line with Kwikiriza et al. (2022), the moisture level in feed materials affects both quality and shelf life; therefore, the allowable tolerance should not exceed 10%. Production is carried out five days per week, with a total of 240 working days per year. The average annual usage of main raw materials (rice bran, coffee husk, and oil palm kernel) at PT Andini Megah Sejahtera in 2023 was 172.51 tons. The procurement and purchasing of main raw materials are conducted in accordance with daily production requirements for ruminant concentrate feed. Procurement decisions also consider the distance and lead time from ordering to delivery at the company. The usage and purchasing of main raw materials are presented in Table 2.

Table 2. Purchase of main raw materials by PT. Andini Megah Sejahtera

No	Raw Material	Ordering Interval	Ordering Frequency	Order Quantity
		--days--	--per year--	--tons--
1	Rice bran	every 1 – 2	228 times	12
2	Coffee husk	every 2 – 3	203 times	8
3	Oil palm kernel	every 5 – 6	52 times	18

Source: Primary Data, 2024

Based on Table 2, it can be observed that the procurement of main raw materials occurs at a high frequency. Rice bran is purchased almost daily from suppliers because the payment arrangement between the company and suppliers can be conducted on a deferred or credit basis. This consideration is beneficial as it can improve the efficiency of the company's financial management. This finding is consistent with Herison et al. (2022), who state that credit payment systems influence operational cash turnover and company profitability. Purchases of coffee husk also show a high frequency because this raw material is sourced from individual suppliers rather than from coffee husk processing factories. Meanwhile, oil palm kernel is purchased 52 times per year. This is because the supplier is located in Kalimantan, so that each order is placed in large quantities to improve efficiency in its procurement costs.

Raw Material Inventory Costs

Raw material procurement entails expenses. One of them is purchasing cost to secure main raw materials which are rice bran, coffee husk, and oil palm kernel. The cost is not only related to ordering cost but also storage cost. Both cost are incurred in the inventory of ruminent concentrate feed produced by PT. Andini Megah Sejahtera, in which the details are as follows:

a. Ordering Cost

Ordering cost refers to the expenditures incurred by the company from the moment an order is placed until the raw materials arrive at the warehouse. The calculation of ordering cost is done for one order of raw materials. The ordering cost is assumed constant for each order. Ordering costs are assumed to remain constant for each order. The magnitude of ordering cost depends on the frequency of orders rather than the order quantity. This is consistent with Rad et al. (2014), who state that high ordering costs are driven by a high purchasing frequency rather than the volume of materials ordered. Therefore, a higher ordering frequency will increase the total ordering cost incurred by the company. The ordering cost incurred by PT Andini Megah Sejahtera for the main raw materials—rice bran, coffee husk, and palm kernel cake—averages Rp3,134,333 per order.

The components of ordering cost include an average telephone cost of Rp1,000 per order and delivery costs calculated per shipment of raw materials. The expenses incurred vary by type of raw material and depend on the distance between the supplier and the company. The costs incurred each time an order is placed for the main raw materials are presented in Table 3.

Table 3. Ordering costs

No	Raw Material	Origin	Ordering Cost
			-- IDR --
1	Rice bran	Sragen	601,000
2	Coffee husk	Temanggung	1,601,000
3	Oil palm kernel	Kalimantan	7,201,000

Source: Primary Data, 2024

b. Strorage Cost

Storage cost is the expense incurred as a consequence of storing raw materials in a particular facility. According to Hermawan et al. (2020), storage cost consists of explicit costs, such as the potential deterioration of materials, and implicit costs in the form of the opportunity cost of invested capital. At PT. Andini Megah Sejahtera, storage costs comprise facility (warehouse) costs, electricity costs, maintenance costs, and handling costs. Facility costs are calculated based on the annual depreciation of the warehouse used for storage. The depreciation cost of the building used to store raw materials amounts to IDR 12,950,000 per year. Electricity costs arise from supporting operational activities in the storage warehouse and are used primarily for warehouse lighting. The company incurs electricity expenses of IDR 2,760,000 in a year. Maintenance costs are incurred for cleaning the building to prevent quality deterioration of raw materials, as well as for repairs and upkeep when warehouse components are damaged. The company spends IDR 11,460,000 annually on warehouse maintenance. Handling costs refer to expenses for unloading incoming raw materials. For every 1 kg of raw material unloaded, a fee of IDR 10 is paid. The handling cost for the main raw material is IDR 380,000 per order. The total storage cost incurred by PT. Andini Megah Sejahtera is IDR 27,550,000, with a storage cost for the main raw material of IDR 4,436 per ton. The storage costs of the main raw material at PT. Andini Megah Sejahtera are presented in Table 4.

Table 4. Raw material holding costs

No	Raw Material	Warehouse Stock	Storage Cost	Annual Storage Cost
		-- tons --	-- IDR --	-- IDR --
1	Rice bran	350	1,552,738	12,137,011
2	Coffee husk	100	443,640	7,239,621
3	Oil palm kernel	50	221,820	4,152,135

Source: Primary Data, 2024

Total Actual Inventory Cost of PT. Andini Megah Sejahtera

Total inventory cost represents the sum of ordering costs and storage costs. Based on the calculation results, the average actual total inventory cost for the main raw materials at PT. Andini Megah Sejahtera is IDR 39,194,917,257 in the year 2023. The magnitude of total inventory cost is influenced by both ordering costs and storage costs of raw materials. High total inventory cost occurs when the company places orders too frequently but in small quantities. High total inventory cost can reduce the profit margin gained by the company. In accordance with Purnomo (2017), inventory cost savings can be achieved through reduced ordering costs when raw materials are purchased in sufficiently

large quantities. Lower total inventory cost is associated with the quantity of raw materials stored and the optimal implementation of FIFO to maintain raw material quality.

Determining Optimal Inventory Quantity Using the EOQ Method

The optimal use of raw materials in the production process of ruminant concentrate feed reflects the level of raw material inventory efficiency. Inventory cost efficiency can be achieved when the company knows when and how often (frequency) raw materials should be ordered. Inventory analysis using the EOQ method includes variables such as annual usage of main raw materials, ordering cost per order, and storage cost per ton of raw materials stored in the warehouse. Based on the EOQ calculation, the optimal order quantities for the main raw materials at PT Andini Megah Sejahtera are 286.99 tons for rice bran, 409.95 tons for coffee husk, and 356.44 tons for oil palm kernel. The EOQ results indicate different order quantities for each raw material due to variations in production requirements, differences in material composition across products, and varying distances between suppliers and the company. This finding is consistent with Misbachul et al. (2018), who state that raw material order quantity is influenced by the amount ordered, production needs, and storage capacity. Ordering frequency is calculated by dividing annual raw material usage by the EOQ result. The calculation shows that the ordering frequency for rice bran is 12.71 times per year, coffee husk 4.57 times per year, and oil palm kernel 1.94 times per year.

Determination of Safety Stock

PT. Andini Megah Sejahtera produces ruminant concentrate feed using a Make to Order (MTO) system, meaning that production is carried out only when order is received from customer. This approach enables the company to avoid storing finished products in the warehouse, thereby significantly reducing storage costs. Safety stock is determined by considering the safety factor, lead time, and the standard deviation of demand for the main raw materials. The service level applied is 95%, with a Z value of 1.645. The safety stock levels are 364.26 tons for rice bran, 198.10 tons for coffee husk, and 143.15 tons for oil palm kernel. These figures indicate that each main raw material has a different safety stock level, which serves as a buffer to anticipate potential delivery disruptions or sudden increases in customer demand. This finding is consistent with, who state that safety stock should be determined optimally to improve operational efficiency and reduce emergency ordering costs.

The variation in safety stock levels among the main raw materials is caused by differences in the degree of uncertainty associated with each material. Safety stock determination takes into account the safety factor, lead time, and the standard deviation of material requirements calculated from the average usage and its variability in the production process. Differences in raw material origins lead to variations in delivery distance and time, while differences in material composition within production formulations result in varying demand fluctuations. These conditions create different levels of supply delay risk and demand uncertainty, causing each raw material to require a distinct safety stock level as a buffer inventory to anticipate delivery disruptions or sudden demand surges, thereby ensuring that the production process continues to operate optimally.

Determination of Reorder Point

The reorder point (ROP) is the inventory level at which stock reaches its minimum threshold, requiring the company to place a new order with suppliers to avoid stockouts. The ROP calculation considers the rate of raw material usage, lead time, and the amount of safety stock. PT. Andini Megah Sejahtera has not yet implemented ROP for its main raw materials (rice bran, coffee husk, and palm kernel cake), as purchasing decisions have so far been based on market availability and price conditions. The ROP values for the main raw materials at PT. Andini Megah Sejahtera are 668.23 tons for rice bran, 666.05 tons for coffee husk, and 546.29 tons for palm kernel cake. The ROP values are considered

efficient thresholds for placing reorder decisions. Furthermore, the maximum inventory that can be accommodated by PT. Andini Megah Sejahtera is 651.25 tons for rice bran, 608.05 tons for coffee husk, and 357.62 tons for oil palm kernel.

Calculation of Total Inventory Cost (TIC) Using the EOQ Method

Total Inventory Cost (TIC) is obtained by summing the total procurement or ordering costs of the main raw materials with the total holding costs. A higher ordering frequency for each raw material will increase ordering costs, which in turn affects the total inventory cost. Using the EOQ method over a year period, the TIC at PT. Andini Megah Sejahtera is Rp3,483,200,594 for rice bran, Rp2,967,881,432 for coffee husk, and Rp1,479,981,104 for oil palm kernel. The total inventory cost differs across raw materials due to variations in their required proportions within the ruminant concentrate feed formulation. This finding is consistent with Umami et al. (2018), who state that the magnitude of TIC in the EOQ method is influenced by the frequency of ordering and the optimal order quantity of raw materials.

Comparison of Raw Material Inventory Control Based on Actual Conditions and the EOQ Method

Table 5. Comparison of main raw material inventory control

No	Description	Actual Method	EOQ Method
1	Quantity per Order (tons)	12.67	352.13
2	Ordering Frequency (times)	161.30	6.40
3	Safety Stock (tons)	-	235.17
4	Reorder Point (tons)	-	626.86
5	Maximum Inventory (tons)	-	586.30
6	Total Inventory Cost (IDR)	39,194,917,257	2,643,687,710

Source: Primary Data, 2024

Based on Table 5, effective inventory management can optimize the use of available resources. The comparison between the company's actual raw material inventory control and the EOQ method aims to determine which approach is more optimal with minimum cost. Based on Table 4, the average order quantity of main raw materials per order under the company's actual method is 12.67 tons, with an ordering frequency of 161.3 times per year (240 days). Ordering decisions at PT. Andini Megah Sejahtera have been based on estimated needs and raw material usage. Rice bran is ordered almost daily, coffee husk is ordered on average twice per day, and oil palm kernel is ordered approximately once every four days. These ordering schedules are intentionally arranged by the company, considering limitations in unloading labor and warehouse capacity. While based on EOQ calculation, the average optimal order quantity of the main raw materials (rice bran, coffee husk, and palm kernel cake) is 352.13 tons per order, with a much lower ordering frequency of 6.40 times per year. Table 4 indicates that the EOQ method is more economical, as it reduces ordering frequency while determining an optimal order quantity. This finding is consistent with Sandriatwati (2017), who states that lower ordering frequency combined with optimal order quantity reduces raw material inventory costs.

PT. Andini Megah Sejahtera has not implemented safety stock for raw materials because the company conducts overall operational planning on a weekly basis, which is considered more realistic. The calculated safety stock value for the main raw materials (rice bran, coffee husk, and oil palm kernel) is 19.23 tons. This amount is assumed to maintain raw material availability during the lead time. Safety stock helps maintain production continuity, as disruptions in the delivery process are unavoidable even when additional time allowances are provided.

PT. Andini Megah Sejahtera has not implemented a reorder point for its main raw materials because the seasonal or periodic nature of these materials encourages the company to purchase them when prices are low, specifically below the average purchase price. Based on calculations using the EOQ method, the company should place a reorder when the average inventory level reaches 626.86 tons. Ensuring the availability of main raw materials guarantees that concentrate feed can be produced and delivered to customers on time, enabling the company to maintain commitments and customer loyalty. Determining the maximum inventory level helps the company optimize raw material inventory control. Maximum inventory and the reorder point are interrelated, where the reorder point represents the minimum inventory level that triggers a new order, while maximum inventory represents the upper limit of raw materials stored within a certain period to prevent quality deterioration of the raw materials. The calculated maximum inventory for the main raw materials at PT. Andini Megah Sejahtera is 586.30 tons, which represents the company's optimal storage level.

The average actual Total Inventory Cost (TIC) for the main raw materials (rice bran, coffee husk, and palm kernel cake) at PT. Andini Megah Sejahtera is Rp39,194,917,257 per year. Using the EOQ method, the average TIC is Rp2,643,687,710 per year. These results indicate that inventory control using the EOQ method yields substantially lower costs than the company's current method, resulting in an average annual cost saving of Rp36,551,229,547. The EOQ method produces lower costs because the reduced ordering frequency decreases ordering expenses. In addition, EOQ improves inventory cost efficiency significantly, reaching 89% for rice bran, 96% for coffee husk, and 93% for palm kernel cake. High raw material efficiency indicates that inventory control operates effectively at the most economical level. The EOQ calculation reduces ordering frequency from an average of 161 times to approximately 6 times per year.

CONCLUSIONS

The EOQ calculation shows that the average optimal order quantities for the main raw materials at PT. Andini Megah Sejahtera are 286.99 tons for rice bran, 409.95 tons for coffee husk, and 356.44 tons for oil palm kernel. The ordering frequencies per year are 12.71 times for rice bran, 4.57 times for coffee husk, and 1.94 times for oil palm kernel. The safety stock levels are 364.26 tons for rice bran, 198.10 tons for coffee husk, and 143.15 tons for oil palm kernel. The reorder point (ROP) values for the main raw materials are 668.23 tons for rice bran, 666.05 tons for coffee husk, and 546.29 tons for palm kernel cake. The Total Inventory Cost (TIC) calculated using the EOQ method over one year amounts to Rp3,483,200,594 for rice bran, Rp2,967,881,432 for coffee husk, and Rp1,479,981,104 for palm kernel cake. Inventory control using the EOQ method is lower than the company's current practice, resulting in an average cost efficiency improvement of about 92% and annual savings of Rp36,551,229,547. A company should implement proper inventory management to anticipate stockouts, and the EOQ method has proven effective in reducing inventory costs. EOQ implementation can be carried out gradually (30%, 70%, and 100%) while considering the company's cash flow. Procurement of main raw materials can be prioritized based on safety stock and ROP levels to maintain production continuity without tying up excessive capital. The company should also continue to pay attention to the availability of supporting raw materials, as they are equally important in the production of concentrate feed.

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