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Analysis Control Supply Raw Materials in Chicken MSMEs Crushed Blessing Use Method *Economy Order Quantity (EOQ)*

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Abstract. Raw material inventory control in culinary MSMEs often faces inefficiencies due to an imbalance between fluctuating demand and inventory availability, which triggers cost overruns. This study aims to optimize chicken meat inventory management at the Ayam Geprek Berkah MSME to minimize total inventory costs. The method used is descriptive qualitative with data collection techniques through interviews, observation, and documentation for the period January-December 2025. Data analysis was conducted using the *Economic Order Quantity (EOQ)* verified through POM QM software *for Windows* . The results showed that the optimal order quantity is 145.2 kg with a frequency of 14-15 times a year which drastically reduces ordering costs from Rp. 3,600,000 to Rp. 362,500 per year. In addition, a safety stock *of* 11.72 kg and a reorder point *of* 17.6 kg were set to maintain production continuity. The implications of this study require MSMEs to increase their *freezer capacity (cold storage)* so that the quality of raw materials is maintained along with the increase in larger and more economical order quantities.

Keywords: Inventory, *Economy Order Quantity (EOQ)*, Cost Ordering, Fees Storage, Efficiency Production

1. INTRODUCTION

MSMEs are a labor-intensive sector capable of absorbing a large workforce. Data from the Ministry of Cooperatives and SMEs in 2019 showed that there were 65.4 million MSMEs in Indonesia, employing up to 123.3 million workers. This demonstrates that MSMEs make a significant contribution to reducing the unemployment rate in Indonesia. In the context of Micro, Small and Medium Enterprises (MSMEs) which are the backbone of the Indonesian economy, controlling raw material inventory is often a crucial point that determines operational continuity, especially in the food industry where the imbalance between fluctuating demand and the availability of raw material inventory such as meat Chicken often triggers production inefficiencies. Effective management plays a crucial role in controlling company operations to ensure smooth operation and achieve desired performance targets. One key focus is optimizing the production process to produce quality products that meet consumer expectations. This relies heavily on inventory management, including raw materials, semi-finished goods, and finished goods. To achieve optimal profits, companies must implement a balanced inventory policy, ensuring inventory is neither too high, which could hoard capital, nor too low, which could prevent the risk of production disruptions [1] . For MSMEs, this balance is the key to business stability.

A business's profitability depends heavily on the smooth running of its production process and the control of raw material inventory. Inventory is an asset held for future periods, making its management crucial. Proper control is necessary to minimize inventory costs and maintain the efficiency of business owners' working capital. [2] . In a way operational , management supply arrange how company ordering, storing, and processing material raw become product ready sell . This process no only related with physique goods in the warehouse , but also includes strategy efficient processing for ensure availability material standard in every line production . Because If amount too much inventory big will trigger waste cost save, temporarily too little inventory is risky remove chance company for reach profit maximum [3]

The low level of understanding of financial management causes many MSMEs to fail to calculate the Cost of Goods Sold correctly, so that determining the selling price often does not provide optimal profits. [4] . In addition, limited access to formal financial institutions encourages dependence on high-interest informal loans which hinder long-term business stability and growth. Because most from MSMEs implementing operational his business without planning , management and recording systematic and measurable finances [5] . Analysis supply material standard very important Because aim for ensure availability stock at an optimal level [6] . One of the technique management effective inventory is *the Economic Order Quantity (EOQ)* model. This model functioning determine amount most efficient ordering use minimize total costs supplies that include cost booking and fees storage . With apply *EOQ*, company no only determine amount purchase but also can count supply maximum , stock safety *(safety stock),* and point booking return *(reorder point)* in a way accurate [7] . Relationship between

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EOQ, safety stock, and *reorder point (ROP)* very close in guard balance operational. *EOQ* focuses on efficiency cost booking, while *safety stock* functioning as reserves for anticipate fluctuations request or delay supply. Through *ROP* integration, company can know right time for order return use ensure availability goods without trigger capital accumulation [8] . The need for will method scientific this very felt by Chicken MSMEs Penyet Blessings. When this, the MSME face challenge big in manage material standard main where often happen imbalance between available stock with need production real. Inability in determine amount optimal ordering causes risk double namely in one side, shortcomings supply can hamper the production process and reduce productivity, but on the other hand the advantages supply trigger swelling cost storage as well as risk damage material standard nature easy damaged. Condition the exacerbated by fluctuations request difficult daily predictability and uncertainty time delivery from supplier. Without existence calculation systematic, Chicken SMEs Penyet Blessing prone to to loss operational. Therefore that, approach through method *EOQ* become very urge For implemented use optimize management inventory, minimize risk costs, and support sustainability operational business.

Problems control inventory at Chicken MSMEs Penyet Blessing can completed through analysis method *Economic Order Quantity (EOQ).* Method This very recommended for control total costs supply with determine quantity the most economical order. In theoretical , cost booking compared straight with frequency order, then with optimize amount order through *EOQ* , frequency orders that are not need can reduced so that the total cost supply become more efficient [9] . Implementation method This promising working capital stability for business units through minimization burden cost storage and ordering in a way simultaneous. In apply system *EOQ*, company need integrate a number of element key, namely amount request annual (D), cost per order (S), and cost storage per unit per year (H). Integration third factor the allows company determine size the most ideal order . Method This very effective for company with pattern relative demand stable and predictable. Besides that is, the *EOQ model* based on assumptions that no there is discount purchase, time lead time is constant, and no happen scarcity supply [10] .

Implementation method *Economy Order Quantity (EOQ)* proven capable reduce total costs inventory and increase working capital efficiency , so that profits earned company become more maximum [1] . Research [11] also shows significant results after and before application of *the Economy Order Quantity* model that this model give benefit with 67% savings for *alcohol* and 42% for *essential oil* at PT Eteris Prima Wiyasa so that capable minimize cost operational and avoid excess supply. Use method this can also help activity operational business in calculation supply material standard as reference in managerial inventory, so that can optimize amount ordering, frequency purchases, and also save cost consequence delay material standard [10] ; [12] .

The main issues raised above in this study, the dependence on speculative conventional inventory management methods resulted in the accumulation of excess ordering costs and suboptimal storage costs, thus hampering the overall production efficiency of Chicken MSMEs. Penyet Blessing. The urgency of this research is even more pressing given the contribution of MSMEs to Indonesia's Gross Domestic Product (GDP), which reaches more than 60%, where inventory optimization through quantitative approaches such as *Economy Order Quantity (EOQ)* can minimize total inventory costs by 15-20% and increase responsiveness to uncertain market demand. The implementation of *EOQ* not only reduces losses due to excess inventory or raw material shortages but also supports MSME resilience amid post-pandemic challenges, such as supply delays and fluctuating food commodity prices.

Although a number of previous studies have explored *EOQ* in MSMEs in the field of food, such as analysis of dry noodle MSMEs which showed significant cost savings through optimal *reorder points* [3] , there is a striking research *gap in specific applications to* chicken production. traditional geprek, where seasonal factors and limited capital of local MSMEs have not been comprehensively integrated with dynamic storage cost variables. Other research on [1] highlights inventory imbalances resulting from manual recording, but fails to empirically quantify the impact of *EOQ on production efficiency, leaving a methodological gap that case studies will fill.* Chicken Penyet Blessings . Thus, this study aims to bridge this gap through a contextual *EOQ analysis, providing an* adaptive inventory control method for similar MSMEs.

2. METHODOLOGY

Study carried out at Chicken UMKM Crushed Berkah is located at Jalan STM Gang Batas No. 52, Medan Amplas District, Medan City. The type of data used in study This including data requirements material standard, cost booking, fees supplies, and time wait *(lead time).* Method research used in study this is qualitative descriptive. The type of data that researchers use is the primary data collected through interviews, observations, and documentation as technique in data collection . Researchers also adapted secondary data as references that support primary data through studies correlated literature with the data model that will be processed and interpreted [13]. As for informant from study This is *the Owner* from target MSMEs with objective for get information about

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inventory data material standard, needs material raw materials , lead time data, price data material raw materials and cost data storage For period month January-December 2025. After obtaining the results data interview, researcher will do data processing using one of the models Research Operation namely *Economy Order Quantity* [14] . Researcher choose this model as effort in management purposeful supplies for determine optimal ordering level return *(Reorder Point)* and inventory safety *(Safety Stock)* use minimize total costs supply as well as reduce risk out of stock supply *(stock-out)*. Data management with *the Economy Order Quantity* model this utilise *POM QM for Windows* as *software* Research Operation For count optimal inventory becomes more effective and efficient as proven by [15] . As for current in study adapted from study [6] following:

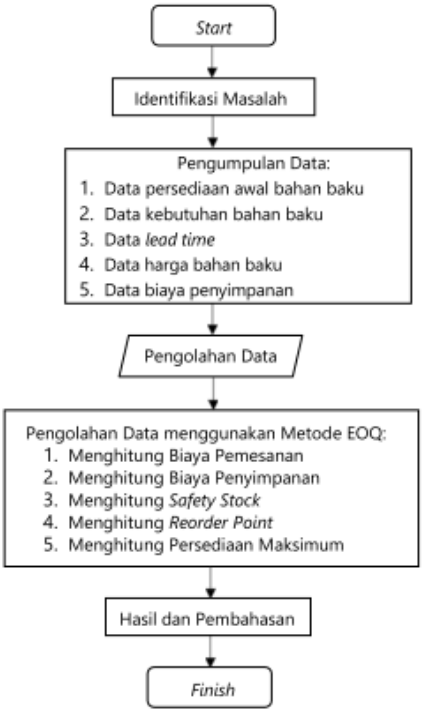

Figure 1. Current Study

Counting techniques *Economy Order Quantity (EOQ)* This will used For determine amount orders that can be minimize total costs supply namely:

$$EOQ = \frac{\sqrt{2 \,.R\,.S}}{H} \text{ [16]}$$

Information :
R or D = Demand Annual (Unit)
S = Cost Order per *Order*
H = Cost Storage per Unit Per Year

Then to be continued with count a number of variables advanced namely :

$$Order\ Frequency\ (F) = \frac{R}{EOQ} \text{ [3]}$$

$$Interval\ Pemesanan\ (T) = \frac{\text{Number of working days in a year}}{F} \text{ [6]}$$

$$Reorder\ Point\ (ROP) = (d\,.\,L) + SS \text{ [11]}$$

Information:
d = Usage Average Raw Materials per Day.
L = *Lead Time* (Waiting Time) Since Order Made Until Goods Come).
SS = *Safety Stock* (Inventory) Safety / Backup).

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$$Total\ Inventory\ Cost\ (TIC)\ =\ \left(\frac{R}{Q}\ .S\right)\ +\ \left(\frac{R}{Q}\ .H\right)$$ [12]

Description:
Q = Number of Units per Order.
$\left(\frac{R}{Q}\ .S\right)$ = Total Cost Booking Annual.
$\left(\frac{R}{Q}\ .H\right)$= Total Cost Storage Annual.

3. RESULTS AND DISCUSSION

3.1. Results

Based on results interview there is expenditure data material standard monthly for Chicken UMKM *Owners* Crushed Blessing following:

Table 1. MSME Raw Material Data

Raw material	Cost per Month	Annual Estimate
Meat Chicken (Main Prospect)	Rp . 6,150,000	Rp . 73,800,000
Flour	Rp . 1,000,000	Rp . 12,000,000
Cooking oil	Rp . 510,000	Rp . 6,120,000
Caplak Chili	Rp . 384,000	Rp . 4,608,000
Etc	Rp . 310,000	Rp . 3,720,000

Source: Data Collection (December, 2025)

Then For count point most economical ordering, researchers focus on the material standard main (meat) chicken), namely:
a. Request Annual (R or D) = 22,108.4 Kg/Year.
b. Cost Order (S) = Rp. 25,000/ order. (Obtained from cost delivery Rp . 300,000/month divided by 12 orders.
c. Cost Storage (H) = Rp. 5,000/Kg/ Year. (Obtained from 10% price assumption meat chicken + cost electricity refrigerator).
d. Price Goods (P) = Rp. 35,000/Kg.

After doing describe material data standard For meat chicken on top , next researchers focus For count MSME supplies use method *Economy Order Quantity* following:
A. Amount the Most Economical Order

$$EOQ = \frac{\sqrt{2 \text{ x } 2.108{,}4 \text{ x } 25.000}}{5.000}$$

$$EOQ = \frac{\sqrt{105.420.000}}{5.000}$$

$$EOQ = \sqrt{21.084}$$

$$EOQ = 145{,}2\ Kg$$

From the calculation this MSME is recommended for buy as much as 145 kg of meat chicken for reach cost cheapest.

B. Frequency Required Reservations Done in a Year

$$Order\ Frequency\ (F)\ =\ \frac{2.108{,}4}{145{,}2}\ = 14{,}5\ times\ per\ year$$

From the calculation This can known that in one year of UMKM is enough do booking as many as 14 to 15 times. From the frequency booking this can concluded that MSMEs can do booking every 25 days once obtained from:

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$$Assumption\ of\ 1\ year\ of\ work\ (360\ days) = \frac{360}{14,5} = 24,8\ days$$

After calculating MSME supplies, next researchers will counting *Lead Time* (time Wait shipping) and *Safety Stock* (inventory) safety) for know How many quantity meat chicken that must ordered when stock in *the freezer* touch number barrier with the following data :

a. *Lead Time (L)* = 1 day (order day today , tomorrow until)
b. *Safety Stock (SS)* = 2 days reserve For anticipate If There is surge customer or delay supplier

C. ROP [1]

Average Usage per day (d):

$$d = \frac{\text{Annual Requirements}}{\text{360 Days}} = \frac{2.108,4\ \text{Kg}}{360} = 5,86\ Kg/day$$

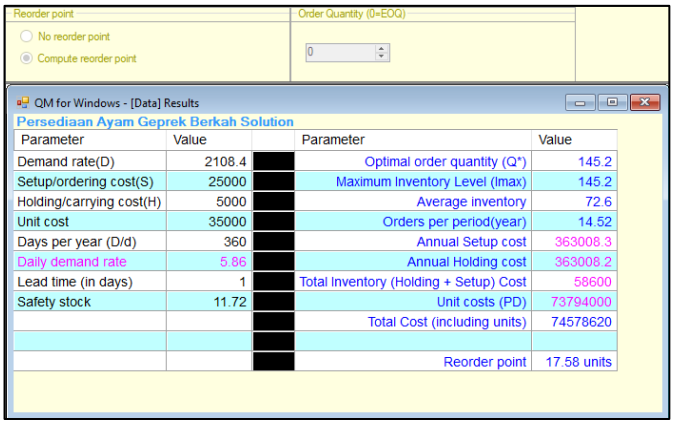
Because of time wait (L) there is 1 day, then *Safety Stock* (inventory) safety) namely:

$$SS = Daily\ Use\ x\ 2\ Days = 5,86\ x\ 2 = 11,72\ Kg$$

D. Calculation Reorder Point (ROP)

$$ROP = (d\ x\ L) + SS$$
$$ROP = (5,86\ Kg/Day\ x\ 1\ Day) + 11,72\ Kg$$
$$ROP = 5,86 + 11,72$$
$$ROP = 17,58\ Kg$$

From the calculation above so need For do booking repeat when amount stock inside MSME *freezer* already touch figure 17.6 Kg.



Parameter	Value		Parameter	Value
Demand rate(D)	2108.4		Optimal order quantity (Q*)	145.2
Setup/ordering cost(S)	25000		Maximum Inventory Level (Imax)	145.2
Holding/carrying cost(H)	5000		Average inventory	72.6
Unit cost	35000		Orders per period(year)	14.52
Days per year (D/d)	360		Annual Setup cost	363008.3
Daily demand rate	5.86		Annual Holding cost	363008.2
Lead time (in days)	1		Total Inventory (Holding + Setup) Cost	58600
Safety stock	11.72		Unit costs (PD)	73794000
			Total Cost (including units)	74578620
			Reorder point	17.58 units

Figure 2. *POM QM* Data Processing for Windows
Source: MSME Inventory Data Processing (December 2025)

After calculating use function Mathematically, researchers also processed MSME inventory data using *POM QM software for Windows* For compare calculated value manually and automatically to be tested optimal solution in do data processing.

The results of the data processing are then can compared to condition before and after Application of *Economy Order Quantity (EOQ) in* the following MSMEs:

Table 2. Comparison Raw material

Information	Condition Moment This	EOQ Recommendation
Frequency Message	12x per month (144x per year).	1x per Month (14.5x per Year)
Quantity per Order	14.6 kg	145.2 kg
Cost Orders per Year	Rp . 3,600,000	Rp . 362,500

Source: Data Processing (December, 2025)

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E. Analysis chart cost supply *(Inventory Cost)*

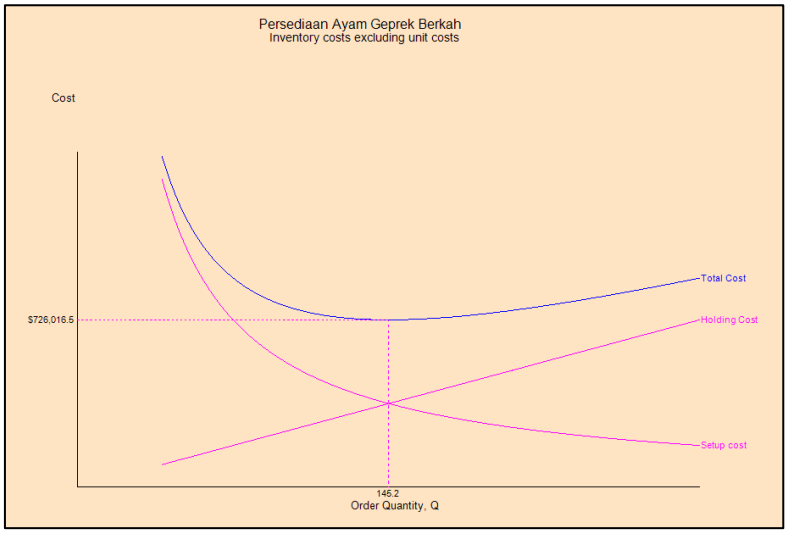

Figure 3. Graph Supply Chicken Crushed Blessing
Source: *POM QM* Data Processing for Windows (December 2025)

The graph above serve connection between cost supply with quantity order (Q). Through chart this, researcher can visualize how does *the Economic Order Quantity (EOQ)* model work? find point balance the most optimal costs for Chicken MSMEs Crushed Blessing namely :

a. Curve Cost Ordering *(Setup Cost)* namely, the curve colored red declining youth from left to right show cost booking. Visible clear that the more big quantity items ordered in one transaction (Q), then the total cost booking annual will the more decreased. This is due to frequency booking become more rare, so cost transportation and admin can pressed.
b. Curve Cost Storage *(Holding Cost)* on the contrary is curve line straight rising from left to right show cost storage. The more big quantity the goods ordered (Q), then the more there is also a high level of inventory that settles in the *freezer*, which means automatic increase cost storage (such as use electricity and risk depreciation).
c. Optimal Point *(EOQ*) and Total Cost Curve *(Total Cost)* as curve colored blue in the section on represents the total cost supply *(Total Inventory Cost).* Based on chart said, efficiency maximum reached at the point lowest curve blue , what happened right at the intersection between curve *Setup Cost* and *Holding Cost*.
    1. Quantity (Q*) is located at 145.2 kg . This is amount suggested order For minimize cost.
    2. Total Minimum Cost at quantity 145.2 kg, cost supply annual (outside cost unit purchase) is amounting to Rp. 726,016.5.

3.2. Discussion

Based on results data processing using *Economic Order Quantity (EOQ)* method and verification through *POM QM for Windows*, found existence difference significant between policy inventory implemented by Chicken MSMEs crushed blessing moment hhis with results analysis optimization that can be done explained in a way systematic, namely:

a. Analysis quantity and frequency booking during this from Chicken MSMEs crushed blessing apply policy purchase material standard very chicken reactive with frequency high, namely as many as 12 orders per month (or 144 times in a year). With total needs annual amounting to 2,108.4 kg, each time an MSME orders only bring in about 14.6 kg of chicken. The height frequency This cause cost booking swell up to Rp. 3,600,000 per year Because accumulation cost transportation and administration every time a transaction done . The calculation results *EOQ* shows that quantity the most economical booking for MSMEs is 145.2 kg per order. If policy This applied, then frequency original order 12 times per month can trimmed become only 14 to 15 times in a year (or on average) every 25 days very).
b. Efficiency cost supply *(Total Inventory Cost)* from change pattern booking this impact directly on efficiency costs. Through the *EOQ* model, the costs booking annual can pressed in a way drastic from Rp. 3,600,000 becomes only Rp. 362,500. Although there is increase in costs storage Because amount stock stored in the

warehouse cooler become more a lot, but the total cost supply in a way overall *(Total Inventory Cost)* reach point lowest (minimum). This is prove that policy *EOQ* capable give savings cost operational significant inventory for MSMEs.

c. Point booking return and security supply For guard continuity production so as not to hampered by delays delivery. Research This set *Reorder Point (ROP)* at 17.6 kg. This means that the Chicken MSME Crushed Blessing must do booking repeat when stock in *the freezer* leaving number This figure Already covers *Safety Stock* of 11.72 kg as step anticipation to fluctuations request customer and delay from side supplier.
d. Recommendation strategic for MSMEs considering characteristics meat chicken which is material standard easy perishable , application of *EOQ* as much as 145.2 kg at once demands that MSMEs ensure capacity and quality *cold storage* or *freezer* in prime condition. If capacity storage limited, MSMEs can take policy alternative in the form of booking regular weekly Far more efficient compared to pattern order moment this , so that quality material standard still awake However cost operational still can minimized.

The graph above can prove that current MSME policies this is what ordered in amount small (±14 kg) but very often (12x a month) be on the side left graph that has *Total Cost* very tall consequence domination cost booking *(Setup Cost).* With shift quantity order to direction right going to point 145.2 kg, Chicken UMKM Crushed Blessing can lower total cost curve until to minimum point. Interpretation this emphasize that significant savings happen no with remove costs, but rather with balance cost messages and costs save in a way accurate.

4. CONCLUSION

Based on data analysis and processing results using one of the inventory models namely *The Economic Order Quantity (EOQ)* method at the Ayam Geprek Berkah UMKM has successfully proven that the application of the method *EOQ* significantly improves operational efficiency and optimizes inventory costs for primary raw materials (chicken) compared to conventional methods currently used. Research shows that the policy of MSMEs ordering very frequently (144 times a year) with small quantities (14.6 kg per order) results in an increase in ordering costs reaching Rp. 3,600,000 per year. Through a quantitative approach, it was found that the most economical ordering point is 145.2 kg with an ordering frequency reduced to only 14-15 times a year. This transformation of ordering patterns can drastically reduce annual ordering costs to Rp. 362,500, thus achieving a minimum total inventory cost. Then, to maintain production continuity and anticipate demand uncertainty, MSMEs are advised to set: a safety stock *of 11.72* kg; a reorder point *is* carried out when the stock in the *freezer unit* remains 17.6 kg. Strategically, even though the amount of inventory stored is greater, the savings in ordering costs are far more dominant in reducing business expenses. Therefore, MSMEs are recommended to increase and ensure adequate storage capacity such as refrigerators/ *freezers* to maintain the quality of perishable raw materials along with the implementation of larger order quantities.

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