

ANALYSIS OF INBOUND AND OUTBOUND GOODS FLOW IN THE FROZEN FOOD WAREHOUSE OF UD. AL BARKAH, PALU CITY

Gilang Ramadan¹⁾, Yulius Duma¹⁾, Ritha Rahayu Mashudie¹⁾, Haerani¹⁾

¹⁾Faculty of Animal Husbandry and Fisheries, University of Tadulako, Palu

Author Corresponden : Gilang Ramadan

E-mail : rmagilang24@gmail.com

Submit: 19 Mei 2025, Revised: 5 June 2025, Accepted: June 2025

DOI : <https://doi.org/10.22487/agroland.v12i1.2566>

ABSTRACT

This research aims to analyze the inbound and outbound flow processes at the frozen food warehouse of UD. Al Barkah in Palu City, Central Sulawesi. Using a qualitative approach with a case study method, the research was conducted in January 2025 with data collection techniques including direct observation, in-depth interviews with 12 key informants, and document analysis. The results show several constraints in UD. Al Barkah's warehouse management includes a time-consuming goods receiving process due to the continued use of physical checking and manual documentation, inadequate implementation of information technology in managing goods movement, and an unintegrated stock management system. This research recommends several improvements, including standardization of operational procedures, implementation of warehouse management information systems, optimization of warehouse layout, enhancement of quality monitoring systems, and development of human resource competencies. Implementing these recommendations is expected to improve operational efficiency, reduce the risk of errors in goods management, and enhance the quality of UD. Al Barkah's frozen food distribution services.

Keywords: Warehouse Management, Goods Flow, Frozen Food, Operational Efficiency.

INTRODUCTION

Technological developments and globalisation have brought about significant changes in the business world. One of the sectors affected is the logistics and supply chain sector. In recent years, the demand for fast, accurate, and efficient logistics services has increased significantly (Nurhaliza, 2024). This is driven by the changing behaviour of consumers who want faster, more transparent, and real-time trackable delivery services (Ikaram, 2021). The

increasingly complex movement of goods requires integrated systems and efficient processes to ensure products reach consumers in optimal conditions, especially for products with special handling needs such as frozen food.

In facing these challenges, logistics companies must optimise their operational processes, including the warehouse management process. An effective warehouse can help logistics companies increase efficiency, reduce costs, and improve service quality (Wau, 2022). According to Putri et al.

(2023), optimal warehouse management can reduce operational costs by up to 30% and improve delivery accuracy by up to 99.9%. For temperature-sensitive products such as frozen food, good warehouse management is crucial as it is directly related to the quality and safety of the stored food.

The frozen food industry in Indonesia has experienced significant growth in recent years. According to data from the Central Statistics Agency (BPS), the production value of the frozen food industry in Indonesia reached IDR 13.4 trillion in 2020, an increase of 10.3% from the previous year (BPS, 2020). This growth aligns with global trends where Euromonitor International (2021) reported global frozen food market growth of 6.8% during 2016-2020, with projected growth of 5.9% per year until 2025. Increasing urban lifestyles, rising number of two-person working families, and ease of storage are the main drivers of this growth (Dhau et al., 2024).

However, the frozen food industry in Indonesia still faces several challenges, such as the lack of adequate logistics infrastructure, the lack of control over product quality, and the lack of ability to cope with changes in market demand (Dhau et al., 2024). Other challenges include cold chain management issues that have not been optimised, especially in areas far from urban centres. According to research by the Ministry of Industry (2021), around 15-20% of frozen food products experience quality degradation during distribution due to inadequate warehouse and transport management.

UD Al Barkah is a company engaged in the storage and distribution of frozen food in Palu City, Central Sulawesi. Established in 2010, the company has grown to become one of the leading enterprises in its field. UD Al Barkah possesses a spacious warehouse for storing frozen food products, as well as vehicles to distribute these products throughout Central Sulawesi. As a regional distributor,

the company plays a strategic role in ensuring the availability of high-quality frozen food products in the local market, serving various customer segments ranging from modern retail, traditional markets, to the hotel, restaurant, and café industry, commonly referred to as "HOREKA."

In carrying out its operations, UD Al Barkah has several objectives, namely providing quality and efficient frozen food storage and distribution services, increasing customer satisfaction by providing fresh and quality goods, and increasing operational efficiency by optimising the use of resources. This aligns with modern supply chain management theory, emphasizing quality, speed, and cost efficiency as the main pillars of competitive advantage (Sabilarrozak & Firdyansyah, 2024).

However, in the warehouse management process, UD Al Barkah still faces several challenges, such as a lack of control over incoming and outgoing goods, ineffective storage and retrieval processes, and insufficient coordination between departments. This condition aligns with the findings of Pratiwi et al. (2021), which state that 60% of medium-scale distribution companies in developing countries still face similar issues in their warehouse operations. These problems include inadequate inventory management systems, lack of real-time monitoring, poor documentation practices, and a shortage of skilled warehouse staff. Such issues contribute to delays in processing orders, inconsistencies in inventory records, and difficulties in tracking product movement. These operational shortcomings can result in serious business impacts, including increased delivery waiting times by 25–30% and a potential for product damage of up to 8–10%.

The frozen food warehouse at UD Al Barkah is critical, considering the specific characteristics of frozen food products that require special handling. According to the Food and Drug Monitoring Agency (BPOM) Regulation No. 23/2018 on Good Food Production Practices, frozen food products must be stored below -18°C to

minimise temperature fluctuations during the storage and distribution process. However, based on observations and document analysis, it was found that the frozen food products in the UD Al Barkah warehouse are stored at an average temperature of -15°C. This temperature is slightly higher than the recommended standard, indicating that the company has not fully complied with the BPOM regulations. Such deviations could impact the quality and safety of the frozen products and may pose health risks to consumers if not promptly addressed.

Therefore, an analysis of the incoming and outgoing goods flow processes at UD Al Barkah's frozen food warehouse needs to be conducted to identify the challenges encountered and provide recommendations for improving these processes. This research is expected to contribute practical insights for enhancing UD Al Barkah's operational performance, as well as theoretical contributions to the development of an optimal frozen food warehouse management model, particularly in the context of medium-scale distribution companies in regions with geographical challenges such as Central Sulawesi.

RESEARCH METHODS

This research uses a qualitative approach with a case study method to analyse the incoming and outgoing goods flow at UD's frozen food warehouse. Al Barkah. The qualitative approach was chosen because it can provide an in-depth understanding of the phenomenon under study through comprehensive data collection (Sugiyono, 2018). The case study design is appropriate for this research because it allows researchers to explore a limited system (case) in a real-life context. The research has been conducted over 30 days at UD Frozen Food Warehouse from 1 to 30 January 2025. Al Barkah located in Palu City, Central Sulawesi.

Data collection has been carried out through several methods to ensure data validity through source triangulation. The

first method was direct observation of the flow of goods in and out of the UD frozen food warehouse. Al Barkah. Observation has been done by observing all process stages, from receiving goods, checking quality, recording, storing, picking, and shipping goods. The second method was in-depth interviews. Interviews have been conducted with various stakeholders, including the owner of UD. Al Barkah, warehouse manager, supervisor, warehouse operational staff, distribution drivers, and customer representatives. A total of 12 informants have been interviewed, selected based on a purposive sampling technique considering their involvement in the goods flow process. The interviews utilised a semi-structured guideline based on preliminary observations and a literature review on warehouse management and frozen food supply chains. Each interview session has been digitally recorded with the informant's permission for transcription and analysis.

The third method was document analysis. Documents that have been analysed include warehouse standard operating procedures (SOPs), records of incoming and outgoing goods for the past six months, inventory reports, warehouse temperature records, refrigeration equipment maintenance reports, and customer complaint reports. Document analysis has provided valuable historical data to identify patterns, trends, and potential problems in the warehouse management process.

Data analysis has been conducted iteratively throughout the data collection process. Qualitative data from observations and interviews have been analysed using thematic analysis techniques, which include six stages: familiarisation with the data, initial coding, searching for themes, reviewing themes, defining and naming themes, and report writing. Meanwhile, quantitative data from process time measurement and document analysis have been analysed using descriptive statistics to identify process efficiency, cycle time, and areas of improvement.

To ensure the validity of the data, several validation strategies have been applied, including triangulation of data sources and methods, member checking, where initial analysis results have been discussed with key informants for verification, and external audits by frozen food logistics and supply chain management experts. Reflexivity has been maintained by noting personal biases, values, and assumptions that might influence data interpretation through a reflective journal that has been updated regularly throughout the research.

The research findings have been presented to the management of UD. Al Barkah in the form of a workshop to validate the results and develop an implementation plan for the recommendations. This participatory approach aligns with the principles of action research, which emphasises collaboration between researchers and stakeholders in developing sustainable solutions (Sugiyono, 2018). The entire research process has been systematically documented to ensure dependability and confirmability of the research results by rigorous qualitative research standards.

RESULTS AND DISCUSSION

General Description

UD. Al Barkah is a company that was founded in the storage and distribution of Frozen Food in 2010. The company has developed into one of the leading players in its field in the Central Sulawesi region, with infrastructure in the form of modern warehouses and an adequate fleet of vehicles. The vision of UD. Al Barkah is to become Indonesia's leading Frozen Food storage and distribution company by prioritising quality, efficiency, and customer satisfaction. To achieve this vision, the company sets five main missions focusing on service quality, customer satisfaction, human resource development, operational efficiency, and cooperation with business partners.

In running its operations, UD. Al Barkah still faces several obstacles in warehouse management, including the lack

of control over incoming and outgoing goods, ineffective storage and retrieval processes, and unoptimal coordination between departments. These constraints can cause problems such as loss or damage to goods, unavailability of goods, and delays in the delivery process.

Analysis and Discussion of the Incoming Goods Process

Receiving Goods

The receiving of goods marks the initial stage in the flow of incoming goods at the UD Al Barkah warehouse, which involves verifying the frozen chicken and beef receipts from suppliers. Observations indicate that this process is conducted in the loading dock area, which is equipped with cooling facilities to maintain the product's cold chain.

However, this stage has some weaknesses, namely the lack of standardised receiving procedures and unsystematic documentation. This is in line with the findings of Kholifatun & Nurcahyo (2018), who stated that 65% of problems in warehouse management originate from the stage of receiving goods that are not standardised. Implementing clear standard operating procedures (SOPs) for receiving goods can improve the accuracy and speed of the process and reduce the risk of errors. In addition, a digital documentation system can help track goods in real-time and integrate information with other departments in the company.

Goods Checking

The goods checking stage at UD Al Barkah consists of two aspects: quantity and quality. This checking is essential to ensure that the goods received are according to order and meet the set quality standards. The interview results show that the checking process is still done manually and relies heavily on the experience of the receiving officer.

This manual approach has several disadvantages, including potential inconsistencies in receiving standards and the time required for the checking process. According to

Fadly et al. (2019), standardising the checking process with the help of technology such as barcode scanners or automatic temperature sensors can increase the accuracy and speed of checking by up to 40%. For sensitive products such as frozen food, implementing an automatic temperature monitoring system is also very important to ensure the integrity of the cold chain is not compromised during the receiving and checking process.

Goods Storage

The final stage of the incoming goods process is goods storage, which begins with creating receiving documents as administrative evidence. Document analysis shows that the storage system at UD. Al Barkah still uses conventional methods for placing goods based on space availability, not on analysis of the rate of turnover of goods.

This practice is less than optimal for storing frozen food products with a limited expiration period. According to Jakasurya & Fatihin (2023), implementing the First-Expired-First-Out (FEFO) system is very important for frozen food products because it is directly related to the quality and safety food. Implementing the FEFO system, accompanied by clear labelling and digital recording of storage locations, can reduce the risk of product expiration and facilitate the picking process when goods are removed from the warehouse. Structuring the warehouse based on product velocity can improve operational efficiency by placing high-turnover products in easily accessible locations.

Analysis and Discussion of the Outgoing Goods Process

Order Receipt

The outgoing goods process at UD. Al Barkah begins with receiving customer orders and verifying the availability of goods in the warehouse. The observation results show that this process is carried out manually and requires a long time, especially when the order volume is high.

According to Novita & Cipta (2023), implementing an inventory management information system can reduce response time to customer orders by 75% and improve inventory data accuracy by 95%. Using an integrated system for order receipt not only speeds up the process of verifying the availability of goods but can also automate stock allocation, facilitate planning for picking goods, and provide faster order confirmation to customers. With an integrated system, UD. Al Barkah can also more easily prioritise orders based on urgency and efficiency of delivery routes.

Goods Packing

After the order is confirmed, the next stage is goods packing, where the goods are taken from the warehouse and packed according to the order. The observation results show that the packing process at UD Al Barkah still faces challenges in terms of efficiency and accuracy, especially in the picking process, which takes a long time due to manual searching for the location of goods.

This finding aligns with Wau's research (2022), which states that manual picking can consume up to 50% of the total warehouse operational time. Using more efficient picking systems, such as zone or batch picking, supported by technologies such as RF scanning or pick-to-light, can significantly improve the speed and accuracy of the process. Standardising packing methods and verification checklists can also help ensure that all items in an order have been included and packed correctly, reducing shipping errors that can impact customer satisfaction.

Delivery of Goods

The final stage in the outbound goods process is the delivery of goods to customers using UD. Al Barkah's fleet of vehicles is equipped with refrigeration facilities. Analysis of shipping documents shows that delivery routes have not been optimised based on logistics efficiency

principles, leading to high fuel consumption and longer delivery times.

According to Sabilarrozak and Firdyansyah (2024), delivery route optimisation can reduce operational costs by up to 30% and improve on-time delivery. Implementing a route planning system that considers distance, travel time, vehicle capacity, and delivery schedule factors can provide significant efficiency for UD. Al Barkah. In addition, real-time delivery tracking technology can improve visibility of delivery status, allow customers to monitor their orders, and help management proactively identify and address delivery issues.

Recommendations for Improving Warehouse Management Systems. UD. Al Barkah

Based on the analysis and discussion above, the following are recommendations for improving the warehouse management system. UD. Al Barkah:

Standardisation and Process Documentation

Developing a comprehensive SOP for the entire goods flow process is necessary. This SOP should include receiving criteria, FEFO storage methods, picking procedures, and packing standards. Good documentation will ensure operational consistency and facilitate performance evaluation. Ikram (2021) states that process standardisation can reduce operational variability by 65% and increase warehouse worker productivity by 30%.

Implementation of Warehouse Management Information System

Implementing a simple warehouse management system tailored to the scale of UD. Al Barkah can significantly improve efficiency. This system will automate the recording of goods movement, inventory monitoring, and coordination between departments. Digitising processes also reduces manual input errors and speeds up information access. Research by Putri et al. (2023) shows that implementing a warehouse information system can improve inventory accuracy by 99.5% and reduce administrative processing time by 60%.

Optimisation of Layout and Goods Flow

Restructuring the warehouse layout by considering the principle of efficient goods flow can reduce the distance workers travel and speed up the picking process. Grouping products based on velocity and implementing a structured location system will facilitate identifying and retrieving goods. Novita & Cipta (2023), warehouse layout optimisation can reduce picking time by 40% and increase storage capacity by 25%.

Quality Monitoring System Improvement

A strict quality monitoring system is essential for frozen food products. Implementing an automated temperature monitoring system and systematic recording of product quality will maintain product integrity. Jakasurya and Faihin (2023) stated that an automatic temperature monitoring system can reduce frozen food product damage by 85% and increase customer confidence in product quality.

Human Resources Competence Development

Regular training for warehouse staff on best practices in frozen food warehouse management, including food safety and operational efficiency, will improve overall performance. A structured competency development programme can also improve employee motivation and retention. Nurhaliza (2024) found that companies with structured training programmes for warehouse staff experienced an increase in productivity of up to 35% and a decrease in operational error rates of up to 45%.

The gradual and integrated implementation of these recommendations is expected to overcome UD's problems. Al Barkah manages frozen food warehouses. A holistic approach that includes process improvement, technology implementation, and HR development will improve operational efficiency, service quality, and customer satisfaction.

CONCLUSION

Based on the research results of the incoming and outgoing goods flow at UD Frozen Food Warehouse. Al Barkah has several significant weaknesses that affect the company's operational efficiency. The process of receiving goods is still carried out conventionally with physical checks and manual documentation, resulting in long processing times, delays in workflow, and increased operational costs. The lack of information technology implementation is a significant obstacle in warehouse management, making real-time stock monitoring and control difficult and increasing the risk of errors in recording and tracking goods. In addition, the stock management system that has not been integrated with the information system creates gaps in coordination between departments, complicates the process of verifying the availability of goods, and potentially leads to errors in decision-making related to ordering and distribution. Modernising the warehouse management system by adopting the right information technology, standardising operational processes, and developing HR competencies are strategic steps that need to be implemented to improve the efficiency and effectiveness of UD. Al Barkah in the future.

ACKNOWLEDGEMENT

The authors would like to express their deepest gratitude to the management of UD. Al Barkah, thank you for providing opportunities, access, and full support during the implementation of this research, and to all parties who have contributed to its completion.

REFERENCES

Dhau, S., Ananda, R., Nurisusilawati, I., & Zulkarnain, N. A. H. (2024). *Optimasi rute distribusi frozen food menggunakan metode principal coordinate analysis dan nearest neighbor*. Jurnal SINTA: Sistem

Informasi dan Teknologi Komputasi, 1(4), 162-170.

Fadly, M., Suhendro, D., & Syahputra, A. (2019). *Perancangan aplikasi persediaan barang dan bahan makanan menggunakan metode FIFO pada KFC pematangsiantar*. Jurnal Ilmiah Media Sisfo, 13(1), 48-58.

Ikram, M. (2021). *Sistem Informasi Expedisi Pengiriman Barang Pada Bagian Distribusi PT. Tempo Banda Aceh*. Jurnal Indonesia: Manajemen Informatika dan Komunikasi, 2(1), 53-62.

Jakasurya, H., & Fatihin, M. N. (2023). *Analisis Proses Alur Material Masuk Dan Keluar Pada Gudang Pusat Pt Pal Indonesia*.

Kholifatun, I., & Nurcahyo, R. J. (2018). *Sistem Kerja Storage Dan Purchasing Departement Terhadap Kelangsungan Operasional Di Hotel Jambuluwuk Malioboro Yogyakarta*. Khasanah Ilmu-Jurnal Pariwisata Dan Budaya, 9(1).

Novita, G. R., & Cipta, M. R. (2023). *Analisis proses alur masuk dan keluar barang pada PT. United tractors semen gresik*.

Nurhaliza, S. N. S. (2024). *Analisis Data Paket Masuk Dan Keluar Menggunakan Power Bi Pada Lion Parcel*. TEKNOFILE: Jurnal Sistem Informasi, 2(11), 868-874.

Putri, D. A., Handayani, R., Yunita, N., & Marlina, S. (2023). *Audit Sistem Informasi Inventaris Toko Cielyn Menggunakan Framework Cobit 5*. Jurnal Digit: Digital of Information Technology, 13(2), 134-143.

Pratiwi, I. T., Zulfikar, Z., & Widya, M. A. (2021). *Sistem Informasi Manajemen*

- Paket Ekspedisi CV. MK Express.*
Jurnal SITECH: Sistem Informasi dan Teknologi, 4(1), 7-18.
- Sabilarrozak, B. M., & Firdyansyah, D. M. (2024). *Analisis Proses Pengadaan Barang/Jasa Departemen Perencanaan Dan Penerimaan Barang/Jasa Di PT. Petrokimia Gresik.*
- Shalshabila, G. A. (2024). *Analisis Sistem Akuntansi Persediaan Barang Pada PT. Bumi Teknik Semesta.*
- Jurnal Inovasi Bisnis Manajemen dan Akuntansi, 2(4), 415-432.
- Sugiyono. (2018). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif dan R&D).* CV. Alfabeta.
- Wau, K. (2022). *Pengembangan sistem informasi persediaan gudang berbasis website dengan metode waterfall.* Jurnal Teknik, Komputer, Agroteknologi Dan Sains, 1(1), 10-23.