

## **Examining Efficiency and Hygiene in Qurban Meat Packaging and Distribution**

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### **Abstract**

This study explores logistical challenges in Qurban meat distribution during Eid al-Adha in urban Muslim communities, focusing on efficiency and hygiene. Using mixed methods, it analyzes data from organizers, volunteers, recipients, and logistics staff. Findings show religious compliance is maintained, but issues include limited cold storage, non-standardized processes, and manpower shortages. Innovative practices like pre-packing, appointments, and eco-packaging help address these gaps. The study enhances halal logistics discourse by connecting traditional values with grassroots operational improvements, offering insights for better policy and practice.

**Keywords:** Qurban Meat Distribution; Packaging Practices; Logistics Efficiency; Hygiene Management

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### **1.0 Introduction**

Eid al-Adha, or the Festival of Sacrifice, is one of the most important religious observances in Islam, remembering Prophet Ibrahim's devotion through the symbolic act of Qurban, the ritual slaughter of livestock such as goats, sheep, and cattle. The Qurban meat is then distributed among family members, neighbors, and especially the underserved B40 (bottom 40% income) group, reflecting the Islamic values of charity, equity, and community solidarity (JAKIM, 2023). While the spiritual and communal dimensions of this practice remain central, the increasing urbanization of Muslim populations has brought renewed attention to the logistical, sanitary, and public health implications of Qurban operations.

In densely populated cities such as Kuala Lumpur, the volume of livestock slaughtered and meat recipients involved during the short post-slaughter window creates significant pressure on community-level distribution networks, particularly those run by mosques, NGOs, and informal volunteer groups. These operations often face constraints such as limited cold-chain infrastructure, lack of standard operating procedures (SOPs), inadequate food handling training for volunteers, and inconsistent packaging standards. Such weaknesses raise concerns about hygiene compliance, meat safety, and overall distribution efficiency, which, if left unaddressed, may undermine not only public health but also the sanctity of the Qurban ritual itself (Rahman & Omar, 2023).

Recent developments, including appointment-based meat collection, pre-packing systems, and the integration of eco-friendly packaging, have emerged as promising community-driven solutions. Moreover, the adoption of digital platforms (e.g., e-Qurban) for online bookings and distribution tracking has introduced new possibilities for improving transparency and scheduling. However, there is a paucity of empirical research assessing how these innovations perform in practice, especially within resource-constrained, community-based settings. Existing literature tends to focus either on theoretical halal logistics or on centralized Qurban models in other countries, often overlooking the ground-level realities faced by organizers and volunteers during distribution (Khan & Khalid, 2021).

This study investigates efficiency and hygiene in urban Qurban meat logistics. Specifically, the objectives of this study are fourfold. First, it aims to identify the prevailing logistics and hygiene practices adopted by Qurban organizers and volunteers during the packaging

and distribution of sacrificial meat. Second, it seeks to determine the critical operational challenges commonly encountered in these phases, such as time constraints, infrastructure limitations, and manpower shortages. Third, the study endeavors to explore the community-driven innovations and adaptive strategies such as appointment-based collection systems and eco-friendly packaging that are being implemented to address these logistical and hygiene-related issues. Finally, it aims to establish evidence-based recommendations that can improve the overall effectiveness, safety, and syariah compliance of Qurban logistics, particularly within grassroots urban contexts.

By employing a mixed-methods approach that triangulates surveys, interviews, and field observations, the study offers a holistic examination of how religiously mandated practices are operationalized within urban logistical constraints. This research contributes to the growing discourse on halal logistics, humanitarian food distribution, and religious supply chains, emphasizing the need for integrated, community-responsive frameworks that respect both syariah obligations and modern public health standards.

## 2.0 Literature Review

### 2.1 Halal Logistics and Qurban Operations

Halal logistics refers to managing transportation, warehousing, and distribution processes in accordance with Islamic principles, ensuring products remain uncontaminated by non-halal elements throughout the supply chain (Ismail et al., 2023). While widely applied in the commercial halal food industry, its integration into ritual contexts like Qurban remains underexplored. Qurban, observed annually during Eid al-Adha, involves time-sensitive slaughter, packaging, and distribution of meat, typically overseen by mosques, NGOs, and volunteers. These activities must comply with syariah requirements concerning slaughter methods, intent, and rightful recipients (Kamarulzaman et al., 2023). However, many grassroots Qurban operations lack cold-chain infrastructure, standardized protocols, and trained personnel, often prioritizing religious adherence over logistical efficiency, raising concerns about hygiene, equity, and quality.

As the halal logistics field evolves, there is growing recognition of the need to merge modern logistical practices with religious obligations to ensure both spiritual and operational integrity. This study draws on Institutional Theory to explore how religious norms shape logistics behaviors and legitimacy (Salleh & Wan-Hussin, 2020), and on Contingency Theory to understand how communities adapt to infrastructural and resource constraints (Ismail et al., 2022). Together, these frameworks offer insights into improving Qurban logistics through culturally grounded, community-driven, and hygienically sound approaches.

### 2.2 Challenges in Community-Level Qurban Operations

Despite its spiritual importance, Qurban's community-level implementation poses significant logistical challenges that affect both efficiency and public health. A key issue is the lack of cold storage facilities, especially critical in tropical climates like Malaysia, where high temperatures accelerate bacterial growth and raise the risk of meat spoilage during extended distribution hours (Rahman & Omar, 2023). Volunteer training is another constraint. Many individuals involved in slaughtering, packing, and distributing lack basic food safety knowledge, increasing the likelihood of cross-contamination. Packaging methods also vary; while some communities use hygienic, eco-friendly materials, others rely on non-standard plastic bags that may fail to meet safety or environmental standards (Nurhazimah & Sakinah, 2020).

Logistical bottlenecks are common during peak collection periods, particularly in urban settings. Crowding, disorganized queues, and the absence of structured scheduling often lead to delays and disputes, undermining the ritual's dignity and equity (Ismail et al., 2023). These issues parallel challenges seen in humanitarian logistics and perishable food supply chains, where rapid delivery, hygiene, and last-mile efficiency are vital. Insights from those sectors, particularly in cold-chain systems, volunteer coordination, and stakeholder engagement can help develop scalable, safe, and community-appropriate Qurban logistics frameworks suited for resource-constrained environments.

### 2.3 Innovations and Digital Transformation

In response to the logistical complexities of Qurban operations, communities and organizations have begun adopting digital innovations to streamline processes. A key development is the rise of platforms like e-Qurban, which support online bookings, payments, and real-time tracking of meat distribution (Khan & Khalid, 2021). These systems offer centralized, transparent solutions for managing participants, scheduling slaughter, and coordinating pick-up or delivery appointments, effectively reducing crowding and administrative burden. Digital transformation enhances operational efficiency, particularly in urban areas with limited space. Appointment-based collection, initially popularized during the COVID-19 pandemic, remains relevant in minimizing congestion and physical interaction. Some initiatives go further, using GPS-enabled delivery tracking and QR-coded meat parcels, allowing recipients to trace their Qurban contributions and improving accountability (Ismail et al., 2022).

Despite these benefits, adoption remains uneven. Under-resourced or elderly-dominated communities often face challenges due to limited digital literacy, high infrastructure costs, and resistance to change (Haron et al., 2022; Aunurrofiq et al., 2023). Moreover, empirical evaluations of such technologies' impact on hygiene, equity, and stakeholder satisfaction are scarce. Addressing this gap, the present study investigates the real-world adaptability and effectiveness of digital innovations in Qurban logistics, contributing to more informed and inclusive implementation (Rahman et al., 2021).

### 2.4 Summary of Literature Gaps

While the literature on halal logistics and Qurban operations has grown, notable gaps persist, particularly concerning community-level implementation. Existing research often focuses on infrastructure, training, and compliance but seldom presents a holistic view that

includes the voices of all stakeholders. Volunteers, organizers, and recipients, despite their critical roles, are frequently absent from scholarly discussions on Qurban logistics (Yusof et al., 2023; Haron et al., 2022). Moreover, most studies adopt either a theoretical or quantitative lens, lacking the depth that mixed-methods designs could provide. As highlighted by Khan and Khalid (2021), few empirical investigations explore how logistical challenges and hygiene practices are experienced on the ground, especially in urban and resource-constrained communities. There is also limited research assessing the adoption and impact of digital innovations, including aspects such as user acceptance, operational performance, and cultural fit (Aunurrofiq et al., 2023). This study addresses these gaps by applying a mixed-methods approach to examine Qurban logistics comprehensively, encompassing infrastructure, technology, community practices, and syariah obligations. By integrating stakeholder narratives with statistical trends and drawing on institutional and contingency theories, it offers an interdisciplinary perspective that bridges religious mandates with modern logistical needs.

### 3. Methodology

#### 3.1 Research Design

This study adopted a mixed-methods, community-based research design to explore both measurable logistics efficiency and lived stakeholder experiences. Structured questionnaires provided quantitative data, while semi-structured interviews offered qualitative depth. This approach allowed for a comprehensive examination of Qurban meat handling, integrating numerical trends with contextual insights from practitioners involved in distribution and packaging activities (Salleh et al., 2022).

#### 3.2 Participants and Sampling

A purposive sampling strategy was used to recruit 50 participants, 25 from mosques and 25 from NGOs, comprising Qurban organizers, volunteers, and recipients. Participants were identified through mosque and NGO coordinators to ensure direct involvement in operations. Additionally, three logistics personnel were interviewed, providing both grassroots and strategic perspectives to balance quantitative reach with qualitative depth (Yusof et al., 2023).

#### 3.3 Data Collection

Data collection involved three methods: structured questionnaires using Likert scales and closed questions for assessing hygiene and efficiency, semi-structured interviews with logistics personnel for exploring adaptive practices, and direct site observations at one mosque and one NGO location. This triangulated approach enriched data quality and provided a holistic view of Qurban packaging and distribution practices (Rahman et al., 2021).

#### 3.4 Data Analysis

Quantitative data from the questionnaires were analyzed using descriptive statistics (mean, percentage) and inferential techniques such as t-tests and correlations in SPSS. Interview transcripts were thematically analyzed by coding key patterns and insights. Coding was done manually using an inductive approach by two researchers to identify recurring themes on operational gaps and adaptive practices. The integration of both quantitative and qualitative data enabled robust interpretation of Qurban operational effectiveness and hygiene management practices (Ismail et al., 2022).

#### 3.5 Ethical Considerations

The study adhered to ethical research standards. Participants were informed of their rights and provided written consent. Anonymity and confidentiality were strictly maintained throughout the process. Ethical approval for the study was obtained from the institutional ethics review board, ensuring compliance with guidelines for human subject research in community and religious contexts (Aunurrofiq et al., 2023).

### 4. Findings

#### 4.1 Demographics

The demographic data show that most respondents were aged between 25–54, with the 45–54 group being the largest (26%). Roles were well distributed, with organizers (40%) forming the majority. Regarding organization type, half were affiliated with mosques, followed by NGOs (30%), community groups (14%), and private vendors (6%), reflecting diverse involvement in Qurban operations.

Table 1. Demographics profile

Category	Frequency (n=50)	Percentage (%)
Age		
Under 25	5	10%
25-34	12	24%
35-44	10	20%
45-54	13	26%
55 and above	10	20%
Role		
Organizer	20	40%
Volunteer	17	34%

Recipient	13	26%
Organization Type		
Mosque	25	50%
NGO	15	30%
Community Group	7	14%
Private Vendor	3	6%

#### 4.2 Efficiency and Hygiene Ratings

Table 2 summarizes respondents' Likert-scale ratings on key aspects of Qurban meat packaging and hygiene, directly reflecting perceptions of efficiency and hygiene. High ratings for a well-organized packaging process ( $M = 4.2$ ) and clear task assignment ( $M = 4.0$ ) indicate overall operational efficiency. Similarly, safe and timely delivery ( $M = 4.0$ ) and timely meat distribution ( $M = 3.8$ ) further support the notion of effective logistical flow. From a hygiene perspective, the item "packaging meets hygiene and environmental standards" received a strong score ( $M = 3.9$ ), suggesting acceptable hygiene compliance. However, the adequacy of cold storage facilities was rated lowest ( $M = 2.8$ ), signaling a major hygiene-related weakness. Additionally, moderate scores for volunteer training ( $M = 3.6$ ) and manpower sufficiency ( $M = 3.5$ ) indicate inconsistencies in hygiene practices due to varying skill levels and limited human resources. These findings directly support the study's objectives to assess efficiency and hygiene, identify operational gaps, and guide future improvements.

Table 2. Summarizes Likert-scale ratings on packaging and hygiene

Item	Mean	SD
Packaging process well-organized	4.2	0.7
Clear task assignment	4.0	0.8
Timely meat distribution	3.8	0.9
Adequate manpower	3.5	1.0
Sufficient cold storage	2.8	1.1
Regular volunteer training	3.6	1.2
Appointment systems to reduce crowding	3.7	1.0
Packaging meets hygiene and environmental standards	3.9	0.9
Safe and timely delivery	4.0	0.8

#### 4.3 Operational Challenges

The majority of the respondents stressed that the pressure of distributing meat within a narrow post-slaughter window, particularly in dense urban areas. One recipient described the experience: *"There were too many people collecting meat at the same time. It was chaos for almost two hours."* Organizers expressed frustration at the lack of staggered scheduling. *"We didn't expect this many to come at once. Everyone wanted to collect early,"* said a mosque official. These challenges point to the urgent need for crowd control mechanisms and scheduling systems to manage distribution flow more effectively.

Moreover, interview data highlighted inconsistencies in volunteer preparedness and role clarity. A volunteer from an NGO commented, *"Most of the helpers came without any idea what to do. We just taught them on the spot."* This ad hoc training approach not only delayed operations but also increased the risk of hygiene breaches due to improper handling of raw meat. Organizers emphasized the need for pre-event briefings and structured role assignments. As one said, *"If we had one proper training session, half of our confusion would have been avoided."* These accounts emphasize the human resource gap in Qurban logistics, echoing survey concerns over inadequate training.

A recurrent theme across interviews was the lack of adequate cold storage and basic infrastructure at community Qurban sites. One logistics coordinator from an urban mosque shared, *"We only have one small freezer, so we can't store all the meat properly. We had to rush everything within a few hours."* This infrastructural limitation not only risks meat spoilage but also forces organizers to compress operations within tight timelines, compromising hygiene protocols. Similarly, another organizer remarked, *"We didn't have a designated space for packing, volunteers were cutting and packing in the same area."* These insights support the quantitative findings and reinforce cold-chain and spatial constraints as critical hygiene risks.

Figure 1 highlights key operational challenges in Qurban meat packaging and distribution, reinforcing core findings of this study. The most frequently reported issue was limited cold storage (60%), which poses a significant threat to maintaining meat hygiene and safety standards. This directly impacts the objective of assessing hygiene compliance, as inadequate refrigeration may lead to spoilage and contamination. The second most cited challenge was time constraints during peak distribution hours (55%), which affects the overall efficiency of the distribution process and reflects logistical strain, aligning with the study's aim to evaluate operational effectiveness. Other notable challenges include insufficient volunteer training (45%) and crowd management difficulties (40%), both of which undermine systematic task execution and hygiene practices. These findings align with the study's objective to identify critical operational barriers and inform targeted improvements. Recognizing these challenges is essential for developing community-based innovations and policy recommendations that

enhance both the efficiency and hygiene of Qurban operations.

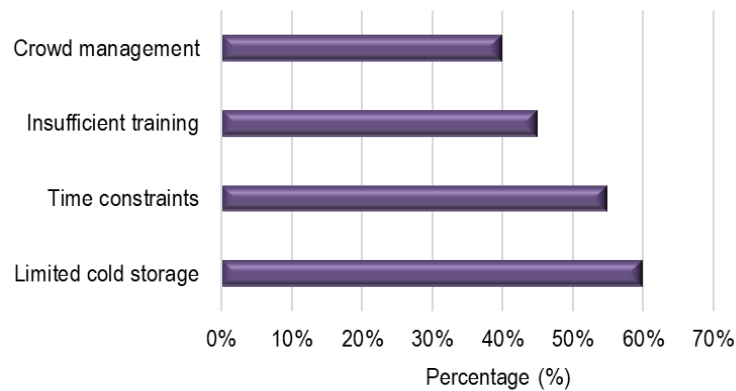


Fig. 1: Key operational challenges

In addition to the quantitative frequencies presented in Figure 1, a visual summary of the thematic challenges identified across survey, interview, and observational data is shown in Figure 2. This infographic categorizes the four dominant operational barriers: inadequate cold storage, lack of volunteer training, inconsistent packaging practices, and distribution bottlenecks. Each challenge intersects with hygiene, timing, and resource constraints, emphasizing the need for holistic, community-tailored logistics planning.



Fig. 2: Challenges in community-level qurban operations

#### 4.4 Innovations and Adaptive Strategies

Figure 2 highlights the key innovations and adaptive strategies proposed and adopted by Qurban organizers to enhance efficiency and hygiene. The most recommended improvement is to increase cold storage capacity (70%), addressing the critical hygiene concern of meat preservation, as identified in earlier findings. This aligns with the study's objective to improve hygiene compliance in community-level Qurban logistics. Standardizing packaging methods (65%) and implementing volunteer training programs (60%) were also prioritized, supporting operational consistency and improving food handling practices, both central to the study's focus on effective and hygienic distribution.

In practice, appointment-based collection systems (55%) and pre-packing strategies (40%) have already been implemented by some organizers to reduce crowding and improve time management, thus enhancing overall efficiency. These adaptive measures reflect community-driven innovations that align with the study's fourth objective: to examine practical strategies that can optimize Qurban operations. Together, these improvements inform evidence-based policy and community recommendations, fulfilling the study's final objective.

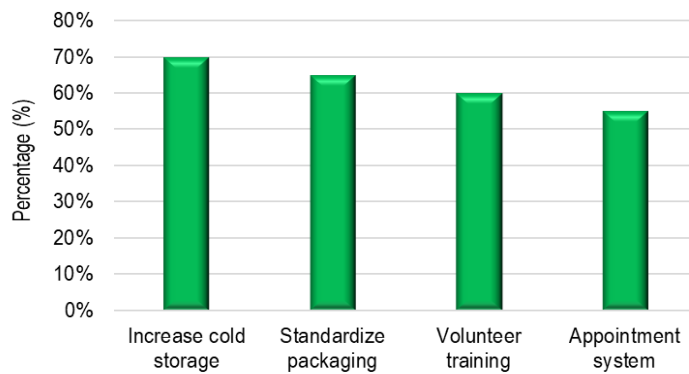


Fig. 2: Key innovations and adaptive strategies

Despite the challenges, several organizers shared creative strategies implemented to enhance hygiene and efficiency. A private vendor explained, “*This year, we started pre-packing the meat into biodegradable trays. It really saved time and reduced contact.*” Another logistics manager said, “*We used appointment slips to space out collection times, and it worked better than expected.*” These grassroots innovations illustrate the community’s adaptability and resourcefulness, especially in the absence of formal logistics infrastructure. They reflect a growing shift toward organized, sustainable, and health-conscious Qurban practices.

#### 4.5 Group Comparisons and Correlations

The analysis of group comparisons and correlations reveals important differences in perceptions of efficiency and key relationships impacting hygiene compliance. Specifically, organizers rated efficiency significantly higher ( $M = 4.3$ ) compared to volunteers ( $M = 3.7$ ), with the difference being statistically significant,  $t(35) = 2.45$ ,  $p = 0.02$ . This suggests that individuals involved in planning and overseeing Qurban logistics may perceive operations as more streamlined than those executing tasks on the ground, echoing previous findings that frontline volunteers often encounter more challenges (Rahman & Omar, 2023).

Furthermore, a moderate positive correlation was found between training frequency and hygiene compliance ( $r = 0.54$ ,  $p < 0.01$ ), indicating that more frequent training is associated with better adherence to hygiene standards. This aligns with Khan and Khalid (2021), who emphasized the importance of capacity building among Qurban volunteers. These findings reinforce the study’s objectives to explore stakeholder perspectives and identify training as a pivotal factor in improving both efficiency and hygiene in Qurban logistics.

## 5. Discussion

The findings of this study reinforce existing literature identifying limited cold storage and insufficient volunteer training as persistent challenges in Qurban meat distribution (Rahman & Omar, 2023). These issues continue to affect hygiene and operational efficiency, especially in urban, resource-constrained settings. The study also highlights the growing use of digital tools such as appointment systems and e-Qurban platforms, aligning with broader halal logistics trends (Yusof et al., 2023; Khan & Khalid, 2021). These innovations offer potential improvements in scheduling and transparency but face uneven adoption due to limited digital literacy and infrastructural gaps (Aunurrofiq et al., 2023).

A key theme emerging from the study is the tension between religious obligation and logistical practicality. While syariah compliance is prioritized, organizers recognize that modern considerations, like food safety and environmental responsibility, are equally vital. As one organizer noted, “*There’s no point in being religious if people fall sick from spoiled meat.*” This underlines the need for community-based frameworks that uphold Islamic values while ensuring public health and operational effectiveness (Salleh et al., 2022).

These findings affirm the relevance of Institutional Theory, as many communities adhere to traditional practices, often resisting digital or procedural changes that do not align with local religious norms (Ismail et al., 2022). Similarly, Contingency Theory is reflected in the varied logistical approaches adopted across communities, shaped by differences in infrastructure, volunteer capacity, and local needs (Haron et al., 2022). Moving forward, standardized training modules, approved packaging SOPs, and digital scheduling systems tailored to community contexts can strengthen Qurban logistics while maintaining religious integrity.

## 6. Conclusion and Recommendations

This study highlights significant infrastructural and operational gaps in Qurban meat packaging and distribution, particularly the lack of adequate cold storage, inconsistent volunteer training, and logistical bottlenecks. However, it also showcases promising community-led innovations such as appointment systems, pre-packing, and the use of hygienic, eco-friendly packaging. While the findings are insightful, limitations include the small sample size and the urban-centric focus, which may not fully represent rural contexts. Moving forward, it is recommended that stakeholders invest in cold-chain infrastructure, develop standardized packaging and hygiene protocols, and integrate digital platforms to enhance coordination, efficiency, and equity in Qurban logistics. Future research should consider rural and semi-urban contexts, comparative studies across states or countries, and longitudinal designs tracking operational change over time.

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## Paper Contribution to Related Field of Study

This study contributes meaningfully to the growing field of halal logistics by addressing a relatively understudied yet significant niche: the operational dynamics of Qurban meat distribution within community-based religious settings. It bridges the gap between ritual compliance and modern logistical efficiency, offering both empirical data and practice-oriented recommendations. By incorporating mixed-methods research and stakeholder perspectives, the study provides a holistic understanding of challenges and innovations, making its findings applicable to policymakers, mosque committees, NGOs, and halal supply chain practitioners. Ultimately, it emphasizes the importance of integrating faith-based values with contemporary public health and logistics management strategies.

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