INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

PROJECT NOTE DECEMBER 2024

Formative Study on Slaughterhouse Hygiene in Western Kenya

Summary Report

Lilian Otoigo, Lorren Alumasa, Hamilton Majiwa, Vivian Hoffmann, Kate Ambler, Alice Kiarie, Elizabeth (Annie) Cook

Introduction and objectives

Slaughterhouses in Western Kenya face critical challenges, including inadequate hygiene practices, poor infrastructure, insufficient water supply, and weak enforcement of regulatory standards. These deficiencies contribute to meat contamination and the transmission of zoonotic diseases such as Rift Valley Fever, brucellosis, and anthrax, as well as foodborne pathogens such as *Salmonella* sp. and pathogenic *E.coli*. Globally, foodborne illnesses result in millions of illnesses and hundreds of thousands of deaths annually, particularly among children under five. The public health and economic consequences of these risks in low and middle-income countries are significant (Havelaar et al., 2015; Jaffee et al., 2018).

A qualitative study, based on interviews of key informants in the slaughter industry in Western Kenya and associated regulatory authorities, was undertaken in 2022 to document the state of slaughterhouse infrastructure and practices, explore barriers to compliance with regulatory standards, and identify practical solutions for improving conditions and enabling safer meat handling practices. This report summarizes the findings of that study and presents recommendations for interventions to improve slaughter hygiene practices.

The specific objectives of the study were:

- Documenting typical current hygiene practices in slaughter facilities and the regulatory priorities of County Veterinary Services
- Understanding the constraints faced by stakeholders, including slaughterhouse workers, facility owners, and meat inspectors, in adhering to hygiene standards
- Assessing the feasibility of leveraging community health volunteers or others to strengthen public oversight of slaughterhouse practices

- Investigating the acceptability of incentive-based interventions on worker compliance with hygiene regulations

In sum, the study aimed to generate a comprehensive understanding of the slaughterhouse environment and inform the development of interventions to address identified challenges.

Methodology

The study was conducted between July and December 2022 and employed qualitative methods to gather insights from diverse stakeholders. At the beginning of the study period, a focus group discussion (FGD) was held with Public Health Officers and Veterinary Directors. Thereafter, a total of 135 key informant interviews (KIIs) were conducted across Kakamega, Busia, Bungoma, and Siaya counties. Respondents included one county director of veterinary services, 15 sub-county veterinary officers, 20 meat inspectors, 39 slaughterhouse workers, 21 facility owners/managers, and 39 livestock owners.

Structured interview guides were used to elicit detailed information about hygiene practices, regulatory enforcement challenges, ideas for improvement, and subjects' feedback on solutions proposed by the researchers. Data analysis was performed using NVivo software, allowing for the identification of themes, patterns and frequencies in participants' responses.

Key Findings

Hygiene Practices & Challenges

Hygiene practices in slaughterhouses varied widely, with most facilities falling short of meeting the standards outlined in the Meat Control Act. Although some workers reported adherence to basic hygiene protocols such as handwashing and equipment cleaning, these practices were inconsistent. Many facilities lacked hot water, soap, and other essential cleaning supplies, which hindered proper disinfection. Workers often used only water to clean their hands and equipment, believing that soap might contaminate the meat or imbue it with an unpleasant odor.

Facility cleanliness was also a major issue. Slaughterhouses were frequently poorly maintained, with insufficient waste disposal systems and no clear separation between clean and dirty areas. Condemnation pits, where diseased meat is disposed of, were often improperly managed, increasing the risk of disease transmission. Unauthorized access to facilities and inadequate fencing further compromised hygiene.

Workers faced challenges in maintaining personal hygiene due to a lack of personal protective equipment (PPE) such as gumboots, aprons, gloves, and head coverings. Many workers could not afford to purchase PPE, and even in government-run facilities, delays in providing these items to workers were common.

Regulation and Enforcement

The enforcement of hygiene regulations was inadequate due to a combination of logistical and institutional challenges. Meat inspectors were often overstretched, with one inspector responsible for multiple facilities. This made it difficult to perform thorough inspections, particularly of ante-mortem and post-mortem processes. Interference by local politicians to prevent closure of noncompliant facilities and lenient enforcement by inspectors further undermined regulatory compliance.

Community resistance to enforcement measures was also noted. Workers and facility owners viewed penalties as punitive rather than protective, leading to a lack of cooperation. Cultural beliefs played a role in this resistance, with some stakeholders adhering to traditional slaughter practices that conflicted with modern hygienic requirements.

Many facility owners and almost all workers were unfamiliar with the Meat Control Act. While some respondents were familiar with the requirements set out in the act, others had only a vague understanding or were unaware of the requirements entirely.

Water Infrastructure

Water access was a significant barrier to maintaining good hygiene in slaughterhouses. Many facilities relied on hand-dug or drilled wells, rainwater harvesting, or water transported to the facility in jerricans. These sources were often insufficient, particularly during dry seasons, and the water was sometimes of questionable quality. Piped water was available in some facilities but was unreliable due to unpaid bills or insufficient infrastructure.

Water was typically transported from the source to the slaughter floor manually in jerricans. This practice posed additional challenges, including contamination risks and inefficiency. Workers often rationed or reused water to reduce trips to the source, limiting its availability for cleaning and handwashing and making it difficult to maintain cleanliness during slaughter operations.

Disease Reporting and Detection

Disease detection and reporting are essential components of the duties of meat inspectors, prioritized by county Departments of Veterinary Services. These activities are focused on preventing the spread of zoonotic diseases such as anthrax and brucellosis. Significant challenges exist in the implementation of these mandates. Meat inspectors are expected to identify diseases through both ante-mortem and post-mortem inspections of each animal, yet because inspectors cover multiple facilities, they are not always able to perform ante-mortem inspections.

Lack of timely reporting was also identified as a problem. Some facilities lacked adequate systems for tracking and reporting diseased animals. As a result of this absence of clear reporting protocols, workers generally failed to report observed health concerns in animals.

A major barrier to effective disease reporting is the lack of training among workers and facility owners, who are often unfamiliar with the symptoms of common zoonotic diseases. Additionally, there is reluctance to report zoonotic symptoms due to the risk that a slaughterhouse customer may suffer financially if an animal is condemned, potentially resulting in loss of business for the facility. A zoonotic disease outbreak could even result in facility closure if public health measures to prevent transport and sale of animals were enacted. To improve disease reporting, it is crucial to enhance training for workers and inspectors on recognizing symptoms and understanding the importance of early detection. Clear reporting protocols should be established to ensure all stakeholders, including workers, managers, and veterinary officers, follow consistent procedures for notifying authorities of potential outbreaks. These protocols should be designed with consideration of the business disincentives for reporting.

Proposed Incentive System

An incentive-based system was proposed to encourage workers to adhere to hygiene standards. The intervention described to key informants involved appointing an individual to monitor hygiene practices and then implementing a reward system for compliant workers based on the monitor's reports. Most respondents supported the idea, citing low worker motivation due to poor pay and challenging working conditions. Incentives such as PPE, bonuses, or additional training were seen as effective ways to drive behavioral change and improve compliance.

However, some stakeholders opposed the idea, arguing that workers should be intrinsically motivated to adherence to hygiene regulations as part of their core responsibilities. Despite these reservations, the majority believed that an incentive system could reduce contamination risks, improve meat safety, and ultimately benefit public health.

Most respondents believed that meat inspectors would be best placed to monitor workers under the proposed incentive system. Meat inspectors are already responsible for overseeing hygiene practices and ensuring compliance with regulations in slaughterhouses. They have the necessary training and expertise to evaluate whether hygiene protocols are being followed during slaughter and meat handling. Additionally, meat inspectors are regularly present on-site and are in direct contact with workers, making them well-positioned to observe practices first-hand and provide immediate feedback.

Barriers to Compliance

Several factors contributed to non-compliance with hygiene standards:

- **Worker capacity and motivation**: Low wages, lack of training, and limited access to PPE and cleaning supplies were significant barriers. Some workers were paid with pieces of meat rather than cash, further limiting their ability to purchase necessary items.
- **Facility infrastructure**: Poor infrastructure, in particular inadequate water supply and insufficient waste management systems hindered compliance.
- **Institutional barriers**: The shortage of meat inspectors, coupled with a lack of vehicles or funds for their transportation, implied that it was often impossible for a single inspector to reach all of the facilities for which he or she was responsible in time to perform ante-mortem inspection, or even timely post-mortem inspection. Delayed provision of government supplies weakened adherence to regulations related to the use of PPE.
- **Cultural Beliefs**: Traditional practices and resistance to modern hygiene requirements contributed to workers' non-compliance with regulatory standards.

Recommendations

1. Improve infrastructure

Slaughterhouses should invest in infrastructure upgrades, including separate clean and dirty areas to reduce cross-contamination, proper fencing, and functional waste disposal systems. Water access should be improved through boreholes, rainwater harvesting, and piped systems. Facilities should also consider installing cold storage rooms to enhance meat safety.

2. *Build the capacity of slaughter workers and meat inspectors*

Regular training programs for workers and inspectors are essential to improve hygiene awareness and practices. Such training, potentially involving the broader community, could address cultural resistance and promote the importance of safe meat handling.

3. *Enhance regulatory enforcement capacity*

The number of meat inspectors should be increased, and their transportation needs addressed to enable effective monitoring. Stricter enforcement measures, including penalties for non-compliance, should be implemented according to existing statutes. Coordination among county departments should be strengthened to ensure consistent oversight.

4. *Introducing Incentives*

An incentive system for workers, including financial bonuses and free PPE, could potentially improve practices. To the extent that regulatory enforcement may be difficult to implement, offering rewards to facilities and workers for compliance could be an effective substitute for punitive measures.

Conclusion

This report has highlighted critical gaps in hygiene practices, infrastructure, and regulatory enforcement within slaughterhouses in Western Kenya. Addressing these challenges will likely require a multi-faceted approach, including infrastructure investment, capacity building, enforcement of existing regulations, and potentially the provision of worker incentives. Evaluating the impact of these interventions through further research will shed light on how to prioritize public and private investments to improve food safety in the meat value chain in Kenya.

ABOUT THE AUTHORS

Lilian Otoigo is a Research Officer in the Animal and Human Health program at the International Livestock Research Institute, based in Busia, Kenya.

Lorren Alumasa is a Research Associate in the Animal and Human Health program at the International Livestock Research Institute, based in Nairobi, Kenya.

Hamilton Majiwa is a Research Officer in the Livestock Climate and Environment program of the International Livestock Research Institute, based in Nairobi, Kenya.

Vivian Hoffmann is a Senior Research Fellow in the Markets, Trade and Institutions unit at the International Food Policy Research Institute (IFPRI) and an Associate Professor in the School of Public Policy and Administration and Department of Economics at Carleton University, in Ottawa, Canada.

Kate Ambler is a Senior Research Fellow in the Markets, Trade and Institutions unit at the International Food Policy Research Institute (IFPRI), based in Washington, D.C.

Alice Kiarie is a Graduate Fellow in the Animal and Human Health program at the International Livestock Research Institute and a PhD student of Veterinary Preventive Medicine, Epidemiology and Public Health at the University of Copenhagen. She is based in Nairobi, Kenya.

Elizabeth (Annie) Cook is a Senior Scientist (Epidemiology) in the Animal and Human Health program at the International Livestock Research Institute, based in Nairobi, Kenya.

ACKNOWLEDGMENTS

Our sincere thanks go to the veterinary departments of Kisumu, Kakamega, Siaya, Busia, Vihiga, and Bungoma counties, whose partnership and collaboration have been invaluable. We also extend our appreciation to the public health departments for their involvement. We acknowledge the essential contributions of stakeholders including customers of slaughter facilities, slaughterhouse workers, and facility owners and managers, whose participation and feedback have been instrumental in shaping the outcomes of this project.

REFERENCES

Havelaar, A., Kirk, M., Torgerson, P., Gibb, H., Hald, T., Lake, R., . . . Devleessschauwer, B. (2015). World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010. *PLoS Med, 12*(12). doi:10.1371/journal.pmed.1001923

Jaffee, S., Henson, S., Unnevehr, L., Grace, D., & Cassou, E. (2019). *The Safe Food Imperative: Accelerating Progress in Low- and Middle-Income Countries.* Washington DC: World Bank.

This work was undertaken as part of the CGIAR Research Initiative on One Health. The CGIAR Research Initiative on One Health aims to demonstrate how One Health principles and tools integrated into food systems can help reduce and contain zoonotic disease outbreaks, improve food and water safety and reduce anti-microbial resistance, benefiting human, animal and environmental health. Other CGIAR centers participating in the CGIAR Initiative on One Health include the International Livestock Research Initiative, the International Water Management Initiative, and World Fish. We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund: https://www.cgiar.org/funders/. This publication has been prepared as an output of the CGIAR One Health Initiative and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A world free of hunger and malnutrition

IFPRI is a CGIAR Research Center

1201 Eye Street, NW, Washington, DC 20005 USA | T. +1-202-862-5600 | F. +1-202-862-5606 | Email: ifpri@cgiar.org | www.ifpri.org | www.ifpri.info