MAKERERE UNIVERSITY

KNOWLEDGE, ATTITUDES, AND PRACTICES OF SLAUGHTER-HANDLERS ON CHICKENS' WELFARE: A CASE STUDY OF INFORMAL SLAUGHTERHOUSES AT KALERWE MARKET

BY

ABAHO ROGERS

23/U/2042

A RESEARCH PROJECT REPORT SUBMITTED TO THE COLLEGE OF VETERINARY MEDICINE, ANIMAL RESOURCES AND BIOSECURITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF ANIMAL PRODUCTION TECHNOLOGY AND MANAGEMENT OF MAKERERE UNIVERSITY

JULY 2026

DECLARATION

I, ABAHO Rogers, do hereby declare that this research report is my original work and has not been presented to any other university or institution for the award of any academic qualification.

Signature: _____ Date: 01/09/2026

ABAHO Rogers (23/U/2042)

SUPERVISORY APPROVAL

This research report has been submitted for examination with my approval as university supervisor.

Signature: _____ Date: 3/09/2026

Dr. Sylvia Nalubwama (BVM, MSc, PhD)
Department of Livestock Industrial Resources,
School of Veterinary Medicine and Animal Resources,
College of Veterinary Medicine, Animal Resources and Biosecurity,
Makerere University.

DEDICATION

This work is dedicated to my family and all those who strive to improve animal welfare and food safety in informal agricultural settings across Uganda and beyond.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to my supervisor for the invaluable guidance, constructive feedback, and encouragement throughout the development of this proposal. I am also grateful to the faculty of the College of Veterinary Medicine, Animal Resources and Biosecurity at Makerere University for the academic foundation that made this work possible. Special thanks to my family and colleagues for their unwavering support.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ABMs	Animal-Based Measures
CAS	Controlled Atmosphere Stunning
DOA	Dead on Arrival
EFSA	European Food Safety Authority
FAO	Food and Agriculture Organization of the United Nations
ILRI	International Livestock Research Institute
KAP	Knowledge, Attitudes, and Practices
KCCA	Kampala Capital City Authority
NCC	National Chicken Council
SPSS	Statistical Package for the Social Sciences
UNBS	Uganda National Bureau of Standards
WOAH	World Organization for Animal Health (formerly OIE)

ABSTRACT

Chicken welfare during slaughter is increasingly recognized as an important component of animal production, food safety, meat quality, and public health. However, information on the knowledge, attitudes, and practices of slaughter handlers regarding chicken welfare in informal slaughterhouses in Uganda remains limited. This study assessed the knowledge, attitudes, and practices of slaughter handlers on the welfare of chickens in informal slaughterhouses at Kalerwe Market, Kampala. Specifically, the study assessed slaughter handlers' knowledge, attitudes, and practices regarding chicken welfare, determined the relationship between knowledge, attitudes, and slaughter practices, and identified factors influencing handlers' attitudes towards chicken welfare. A cross-sectional study design employing quantitative methods was used. A total of 150 slaughter handlers were recruited through a census of all eligible and consenting handlers operating in informal slaughterhouses at Kalerwe Market. Data were collected using a structured interviewer-administered questionnaire comprising sections on socio-demographic characteristics, knowledge, attitudes, and self-reported slaughter practices, complemented by an observational checklist to assess actual slaughter welfare and hygiene practices. Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics were used to summarize respondents' characteristics and KAP scores. Spearman's rank correlation and multiple linear regression were used to determine relationships between knowledge, attitudes, and slaughter practices, while binary logistic regression identified factors associated with positive attitudes towards chicken welfare. Statistical significance was considered at $p < 0.05$.

The findings showed that 74.7% of respondents had adequate knowledge of chicken welfare, while 84.0% demonstrated positive attitudes towards humane slaughter and food safety. Overall, 60.7% of slaughter handlers exhibited good self-reported slaughter practices, although direct observation revealed lower compliance with recommended welfare and hygiene standards than respondents had reported. Knowledge was positively associated with attitudes ($\rho = 0.41$, $p < 0.001$), self-reported slaughter practices ($\rho = 0.53$, $p < 0.001$), and observed slaughter practices ($\rho = 0.49$, $p < 0.001$). Similarly, positive attitudes were significantly associated with improved self-reported ($\rho = 0.48$, $p < 0.001$) and observed slaughter practices ($\rho = 0.44$, $p < 0.001$). Multiple linear regression demonstrated that both knowledge ($\beta = 0.39$, $p < 0.001$) and attitudes ($\beta = 0.31$, $p < 0.001$) independently predicted slaughter practices. Multivariable logistic regression further revealed that formal welfare training (or = 4.48; 95% CI: 1.48–13.55), attainment of at least O-level education (or = 3.21; 95% CI: 1.24–8.29), and previous regulatory inspection (or = 2.87; 95% CI: 1.15–7.15) were significant predictors of positive attitudes towards chicken welfare.

Although most slaughter handlers possessed adequate knowledge and positive attitudes towards chicken welfare, important deficiencies remained in the implementation of recommended humane slaughter practices, particularly regarding pre-slaughter stunning, proper bird restraint, and consistent adherence to hygiene standards. Improving access to formal welfare training, strengthening routine regulatory inspection, and promoting continuous education of slaughter handlers are likely to improve humane slaughter practices, enhance poultry welfare, and contribute to safer poultry meat production in informal slaughterhouses.

CHAPTER ONE: INTRODUCTION

1.1 Background

The global poultry industry has experienced remarkable growth over the past decades, with chicken being one of the most widely consumed sources of animal protein worldwide. Approximately 70 billion broiler chickens are slaughtered annually to meet the growing global demand for poultry meat, making the poultry slaughter industry the largest terrestrial animal slaughter industry in the world (Aghwan and Mac Regenstein 2019). In sub-Saharan Africa, chicken production and consumption have risen steadily, driven by urbanization, population growth, and increasing demand for affordable animal-source foods (Carron, Alarcon et al. 2017). Uganda, like many developing countries, relies on both formal and informal poultry slaughter systems to meet this demand, with informal slaughterhouses playing a predominant role, particularly in urban markets. In the Ugandan context, informal slaughterhouses refer to unregistered, unlicensed slaughter points that operate outside the regulatory framework established by the Uganda National Bureau of Standards (UNBS), typically lacking approved infrastructure, veterinary oversight, and trained personnel (UNBS, 2017).

Kalerwe Market, located in the Kawempe Division of Kampala, is one of the largest live bird markets in Uganda. It serves as a major hub for the sale and slaughter of chickens, catering to a wide consumer base across the city. However, the chicken slaughter operations in this market are largely unregulated, carried out by handlers who often lack formal training in humane slaughter techniques or animal welfare principles (Njoga, Ilo et al. 2023). The slaughter process in such informal settings typically involves manual restraint, neck cutting without prior stunning, and minimal attention to reducing pain and distress in the birds (Fuseini, Miele et al. 2023).

Animal welfare during slaughter is a matter of growing global concern. The World Organization for Animal Health (WOAH, formerly OIE) has established standards for humane slaughter that emphasize the need for proper handling, effective stunning, and rapid killing to minimize suffering. In formal slaughter facilities, various stunning methods such as electrical water bath stunning and controlled atmosphere stunning (CAS) are employed to render birds unconscious before slaughter (Berg and Raj 2015). However, in informal slaughterhouses, such as those at Kalerwe Market, these technologies are rarely available, and slaughter is often performed using

rudimentary methods that may compromise the welfare of the birds (Fuseini, Miele et al. 2023, Njoga, Ilo et al. 2023).

The knowledge, attitudes, and practices (KAP) of slaughter handlers are central determinants of animal welfare outcomes at slaughter. The European Food Safety Authority (EFSA) identified 35 welfare hazards across all phases of poultry slaughter, with the majority being staff-originated, underscoring the decisive role of handler competence (EFSA AHAW Panel, 2019). Handlers who understand the basic principles of animal welfare, including the Five Freedoms, are more likely to adopt practices that reduce unnecessary suffering. Conversely, poor knowledge and negative attitudes towards animal welfare can lead to rough handling, inadequate bleeding, and prolonged consciousness during slaughter, all of which constitute significant welfare violations (Assata et al., 2023; Sinclair et al., 2023).

Studies conducted in West and East Africa have demonstrated that many slaughterhouse workers in informal settings have limited awareness of welfare requirements and operate under conditions that fall short of accepted standards. Aunis et al. (2025), in a study of slaughterhouse workers in Ghana, found that while 88.8% of respondents were aware of the concept of animal welfare, only 44.4% had received formal training, and 55.6% never verified whether animals were properly stunned before slaughter. Similarly, Descovich et al. (2019) demonstrated in Chinese abattoirs that training programmes significantly improved handler knowledge, but that education level and gender also influenced knowledge scores and attitudes. Phillips et al. (2019) found in a multi-country study across East and Southeast Asia that regional differences in knowledge and attitudes were evident and should be considered in training provisions.

Beyond welfare considerations, poor chicken slaughter practices also have implications for food safety and public health. Improper handling and unhygienic slaughter conditions contribute to microbial contamination of chicken carcasses, posing risks of foodborne illnesses to consumers (Lunestad et al., 2022; Ssemanda et al., 2024). Ovuru et al. (2023) noted that conditions in sub-Saharan African slaughterhouses enable the growth and spread of foodborne pathogens due to poor hygiene. The intersection of animal welfare and food safety in informal slaughter contexts underscores the need for a comprehensive assessment of handlers' knowledge, attitudes, and practices.

This study was carried out to assess the knowledge, attitudes, and practices of chicken slaughter handlers regarding chicken welfare and food safety at the point of slaughter in informal slaughterhouses at Kalerwe Market, Kampala. By characterizing the current KAP landscape among handlers, the findings will inform targeted interventions aimed at improving both animal welfare and food safety in informal poultry slaughter operations in Uganda.

1.2 Statement of the Problem

Poor chicken slaughter practices in informal slaughterhouses, particularly in settings such as Kalerwe Market, result in compromised chicken welfare at the point of slaughter. Informal slaughterhouses in developing countries, including Uganda, are characterized by a lack of regulatory oversight, inadequate infrastructure, and limited training of slaughter personnel (Ovuru et al., 2023; Njoga et al., 2023). During a situation analysis at Kalerwe Market, it was observed that chickens are slaughtered under conditions that often fail to meet basic animal welfare standards: birds are frequently handled roughly, subjected to prolonged restraint, slaughtered without stunning, and left to bleed in unsanitary conditions.

The welfare concerns are compounded by the fact that most slaughter handlers in informal settings have not received formal education or training on animal welfare principles. Studies in similar settings across Africa have shown that knowledge gaps among handlers are strongly associated with poor welfare outcomes. In addition, the majority of informal slaughterhouses are unlicensed and not regularly inspected (Assata et al., 2023; Aunis et al., 2025). In another study by Sinclair et al. (2023), it was reported that handlers' attitudes towards animal welfare are associated with their cultural beliefs, economic pressures, and consumer preferences, sometimes reinforcing practices that prioritize speed and cost efficiency over humane treatment.

Despite the growing body of research on chicken slaughter welfare in formal settings, relatively few studies have focused specifically on the welfare of chickens during slaughter in informal markets in East Africa, and even fewer have examined the KAP of handlers as a contributing factor. In Uganda, there is a notable absence of empirical data on how slaughter handlers' knowledge, attitudes, and practices influence chicken welfare outcomes in informal slaughterhouses. This gap limits the ability of policymakers, veterinary authorities, and animal welfare organizations to design evidence-based interventions.

1.3 Study Objectives

1.3.1 General Objective

To assess slaughter handlers' knowledge, attitudes, and practices on chicken welfare and food safety during slaughter in informal slaughterhouses at Kalerwe Market.

1.3.2 Specific Objectives

1. To assess the knowledge, attitudes, and practices of slaughter handlers on the welfare of chickens and food safety in informal slaughterhouses at Kalerwe.
2. To determine the relationship between knowledge, attitude, and chicken handlers' slaughter practices in informal slaughterhouses at Kalerwe.
3. To assess the factors that influence slaughter handlers' attitudes towards the welfare of chickens at slaughter in informal slaughterhouses at Kalerwe.

1.4 Research Questions

1. What level of knowledge do slaughter handlers have on the welfare of chickens at food safety at slaughter in informal slaughterhouses at Kalerwe?
2. What are the attitudes and practices of slaughter handlers concerning the welfare of chickens and food safety at slaughter in informal slaughterhouses at Kalerwe?
3. Is there a significant relationship between the knowledge, attitudes, and slaughter practices of chicken handlers in informal slaughterhouses at Kalerwe?
4. Which factors influence slaughter handlers' attitudes towards chicken welfare in informal slaughterhouses at Kalerwe?

1.5 Justification and Significance of the Study

This study is justified by the growing global emphasis on animal welfare as a component of sustainable livestock production and the conspicuous absence of empirical data on chicken welfare in informal slaughter settings in Uganda. Kalerwe Market, as one of the busiest live bird markets in Kampala, presents a critical case for understanding how handlers' knowledge, attitudes, and practices affect the welfare of chickens at the point of slaughter.

From a scientific perspective, the study generates baseline data on the current KAP status of slaughter handlers regarding chicken welfare. This information is essential for identifying specific knowledge gaps, attitudinal barriers, and practice deficiencies that can be targeted through training and capacity-building programmes. Evidence from comparable settings in Burkina Faso, Ghana, and Nigeria has demonstrated that targeted interventions can significantly improve slaughter practices when informed by KAP assessments (Assefa, Dione et al. 2023, Njoga, Ilo et al. 2023, Awuni, Abiliba et al. 2025).

From a policy standpoint, the findings provide evidence that can guide the formulation and enforcement of animal welfare regulations for informal slaughterhouses in Uganda. Currently, the regulatory framework for poultry slaughter welfare in informal markets remains weak, and data-driven policy recommendations are needed to strengthen it. Sinclair, Hötzel et al.,(2023) demonstrated in a 14-country study that cultural and religious factors significantly influence public perceptions of animal welfare at slaughter, suggesting that policies must be context-sensitive. The study's results may also inform the work of veterinary public health authorities and non-governmental organizations working on animal welfare advocacy in the region.

Furthermore, improving chicken welfare at slaughter has direct implications for meat quality and food safety. Poor slaughter practices, including inadequate bleeding and stress-induced physiological changes, contribute to reduced product quality. (Govindaiah, Maheswarappa et al. 2023) demonstrated that slaughter method significantly affects stress biochemistry and meat proteome, while Riggs, Hauck et al., (2023) showed that stunning method influences physiological stress indicators. By addressing the welfare dimension, this study contributes to broader efforts to enhance both meat quality and food safety in informal poultry value chains.

The significance of this study also extends to the training of veterinary and animal science students, as it provides a practical model for assessing welfare in informal settings-an area that is often overlooked in formal curricula but is highly relevant to the realities of livestock management in developing countries.

CHAPTER TWO: LITERATURE REVIEW

2.0 Overview of Chicken Welfare

Chicken welfare refers to the physical and psychological well-being of birds in relation to the conditions under which they are reared, handled, transported, and slaughtered. According to the World Organisation for Animal Health, animal welfare exists when an animal is healthy, comfortable, well-nourished, safe, and able to express natural behavior without suffering from pain, fear, or distress (WOAH, 2019). In poultry production systems, welfare is increasingly recognized as an essential component of sustainable livestock production due to its close relationship with productivity, meat quality, and public health.

Assessment of chicken welfare involves both animal-based indicators, such as injury rates, mortality, and behavioural responses, and resource-based indicators, including housing conditions, equipment, and handling practices. The European Food Safety Authority AHAW Panel (2019) emphasizes that welfare hazards are particularly significant during pre-slaughter handling and slaughter processes, where human interaction is most intensive. Practices such as rough handling, inversion, overcrowding, and delayed slaughter can cause severe stress and suffering in birds.

In informal slaughter systems, which dominate in many developing countries, including Uganda, welfare challenges are more pronounced. These systems are often characterized by limited infrastructure, lack of stunning equipment, and minimal adherence to humane slaughter standards. Consequently, birds may experience prolonged consciousness and pain during slaughter, especially when improper neck-cutting techniques are used. Studies have shown that in such settings, the knowledge and behavior of slaughter handlers play a critical role in determining welfare outcomes (Fuseini, Miele et al. 2023, Njoga, Ilo et al. 2023). Therefore, improving chicken welfare in informal slaughterhouses requires a comprehensive understanding of handler knowledge, attitudes, and practices.

2.1 The WOAH Global Animal Welfare Strategy

The World Organisation for Animal Health developed the Global Animal Welfare Strategy to provide a coordinated international approach to improving animal welfare across member countries. This strategy recognizes that animal welfare is not only an ethical issue but also a key component of animal health, food safety, and sustainable agricultural development (WOAH,

2017). It promotes the integration of welfare considerations into national policies and veterinary services. The strategy is built on four main pillars: the development of international animal welfare standards, capacity building through education and training, communication and awareness creation, and the implementation of welfare standards through legislation and policy frameworks. These pillars aim to ensure that all stakeholders, including farmers, transporters, and slaughterhouse workers, have the knowledge and tools necessary to apply humane practices.

In the context of poultry slaughter, WOAH standards emphasize that animals should be handled calmly, stunned effectively where applicable, and slaughtered in a manner that minimizes pain and distress. However, the implementation of these standards remains a significant challenge in informal slaughter systems, where limited resources, inadequate infrastructure, and lack of regulatory enforcement hinder compliance. As noted by Fuseini, Miele et al., (2023), small-scale and informal slaughter operations often lack the capacity to implement recommended welfare practices, making handler training and awareness critical entry points for improvement.

2.2 Animal Welfare Freedoms/Domains

Animal welfare assessment is commonly guided by the frameworks of the Five Freedoms and the Five Domains Model, both of which provide a structured approach to evaluating the well-being of animals. The Five Freedoms, originally developed by the Farm Animal Welfare Council (2009), outline the basic conditions that should be ensured for all animals. These include freedom from hunger and thirst, freedom from discomfort, freedom from pain, injury, and disease, freedom to express normal behavior, and freedom from fear and distress. These principles are widely applied in assessing animal welfare across different production systems, including poultry slaughter. For example, rough handling and improper restraint violate the freedom from fear and distress, while poor slaughter techniques compromise the freedom from pain and injury.

While the Five Freedoms provide a foundational framework, the Five Domains Model offers a more comprehensive and modern approach by incorporating both physical and mental aspects of welfare. The model includes the domains of nutrition, environment, health, behavior, and mental state, emphasizing that welfare is not only about minimizing negative experiences but also about promoting positive ones (Mellor 2016). In slaughter contexts, however, the focus is primarily on preventing negative experiences such as pain, fear, and distress.

In informal slaughterhouses, multiple domains are often compromised simultaneously due to poor handling, inadequate facilities, and lack of training. For instance, overcrowding during holding affects behavior and mental state, while improper slaughter techniques impact health and cause pain. Therefore, both the Five Freedoms and the Five Domains Model are useful frameworks for understanding and assessing welfare challenges in such settings.

2.3 UNBS Guidelines for Abattoirs/Slaughterhouses

In Uganda, the Uganda National Bureau of Standards (UNBS) provides guidelines for the establishment and operation of abattoirs/slaughterhouses to ensure food safety, hygiene, and animal welfare. These guidelines outline the minimum requirements for infrastructure, sanitation, animal handling, and personnel training (UNBS, 2017).

The guidelines stipulate that abattoirs should have clearly defined areas for lairage, slaughter, carcass dressing, and waste disposal, with proper drainage and non-slip floors to facilitate cleaning and prevent accidents. Adequate water supply is essential for maintaining hygiene, while waste management systems must be in place to prevent environmental contamination. In addition, animals should be handled humanely to minimize stress and injury, and slaughter procedures should be carried out using sharp knives to ensure rapid bleeding and minimize suffering.

Personnel working in abattoirs/slaughterhouses are expected to be trained in both hygiene and humane animal handling practices. Regular inspection by veterinary and public health authorities is also required to ensure compliance with standards. However, despite the existence of these guidelines, many informal slaughterhouses in Uganda operate below the required standards due to limited resources, lack of enforcement, and absence of formal registration. As a result, both animal welfare and food safety are often compromised in these settings (Ssemanda, den Besten et al. 2024).

2.4 Slaughterhouse/Abattoir Set-Up in Uganda (Informal Context)

In Uganda, poultry slaughter is predominantly carried out in informal settings, particularly in urban live bird markets such as Kalerwe. These informal slaughterhouses play a crucial role in meeting the high demand for poultry meat but are often characterized by inadequate infrastructure and poor adherence to regulatory standards(Carron, Alarcon et al. 2017). Typically, informal slaughter operations are conducted in open spaces or temporary structures without proper flooring, drainage,

or separation of slaughter activities. All processing steps, including killing, defeathering, and evisceration, are performed manually using basic tools. Stunning is rarely practiced, and slaughter is usually carried out through manual neck cutting. Access to clean water is often limited, and waste disposal systems are poorly managed, leading to unhygienic conditions.

Furthermore, most slaughter handlers in these settings acquire their skills informally and lack formal training in animal welfare and hygiene practices. Regulatory oversight is minimal, with many operations being unlicensed and rarely inspected by authorities. Studies across sub-Saharan Africa have documented similar conditions, highlighting widespread poor hygiene and inadequate welfare practices in informal slaughter systems (Njoga, Ilo et al. 2023, Ovuru, Izah et al. 2024).

These conditions have significant implications for both animal welfare and food safety. Birds are more likely to experience stress, pain, and prolonged consciousness during slaughter, while poor hygiene increases the risk of microbial contamination of meat. Consequently, improving welfare and safety in informal slaughterhouses requires targeted interventions focused on training, awareness, and gradual upgrading of facilities.

2.5 Pre-Slaughter Handling and Transport of Chickens

Pre-slaughter handling is a critical welfare dimension that directly affects birds before they reach the point of slaughter. Saraiva, Esteves et al. (2020) investigated pre-slaughter factors adversely affecting broiler welfare at slaughter in Portugal and found that across 64 batches from 64 farms, the average dead-on-arrival (DOA) rate was 0.29%. DOA was significantly influenced by transport distance, catching time, and ambient temperature. Short transport distances, catching birds before midnight, and night transport were found to be crucial for decreasing DOA rates and improving welfare outcomes. (Averós, Balderas et al. 2020) further assessed the effects of transport risk factors on DOA and carcass rejections using data from 2,284 flocks covering over 10 million broilers across 217 farms, revealing that slaughter records constitute a valuable but underutilized resource for identifying transport risk factors and informing welfare improvements.

While these studies were conducted in formal settings, the principles are directly applicable to informal slaughterhouses. At markets like Kalerwe, chickens are often transported over long distances in overcrowded containers without climate control, handled roughly during loading and unloading, and held in stressful conditions before slaughter. A study in Uganda's poultry value

chain documented similar pre-slaughter welfare challenges, including rough handling during transport and inadequate lairage conditions at market points, which were associated with increased bird mortality and injury rates (FAO/ILRI Research Team, 2020).

2.6 Chicken Slaughter Practices and Hygiene in Informal Settings

Informal chicken slaughterhouses in sub-Saharan Africa operate under conditions that present both welfare and food safety challenges. Ovuru, Izah et al. (2024) evaluated sanitation and hygiene practices in slaughterhouses across selected sub-Saharan African countries and found that poor personal and environmental hygiene conditions were widespread. The authors concluded that conditions in these facilities enable the growth, survival, and spread of foodborne pathogens, posing significant public health risks. In another study by Carron, Alarcon et al., (2017), which used a value chain framework to examine the broiler meat system in Nairobi, Kenya, the researchers found that on-farm and market-level chicken slaughter operations used minimal sanitary measures, with only hot water available and no cold chain facilities.

(Reiche, Jakobsen et al. 2025) assessed poultry process hygiene along two broiler slaughter lines in Norway and demonstrated that bacterial loads decreased along the slaughter line by 2.1 log when proper process controls were in place, with scalding and chilling steps being particularly important for pathogen reduction. While Althaus, Zweifel et al., (2017) analyzed the influence of specific slaughter operations on microbiological contamination of poultry carcasses and found that Campylobacter prevalence ranged from 11% after scalding to 42% after plucking, showing that specific process stages significantly influence contamination levels.

Ssemanda, den Besten et al. (2024) developed quantitative microbial risk assessment models for Salmonella and Campylobacter along the chicken value chain and found that multiple combined food safety interventions are more effective than single ones. Hygienic slaughter practices were identified as one of the most impactful intervention points.

2.7 Chicken Welfare During Slaughter

Animal welfare during poultry slaughter has received considerable scientific attention, particularly in formal processing contexts. Berg and Raj (2015) provided a comprehensive review of stunning methods for poultry, noting that effective electrical stunning requires the induction of generalized epilepsy and that electrical water bath stunning, while dominant globally, carries significant

welfare concerns including pre-stun shocks and inadequate stunning of individual birds. They concluded that controlled atmosphere stunning (CAS) offers superior welfare outcomes by reducing the need for live shackling and the associated distress.

Gent, Gebhardt-Henrich et al. (2020) directly compared the aversiveness of three stunning methods: low atmospheric pressure (LAPS), carbon dioxide, and nitrogen, using a single-bird approach and found that CO_2-exposed birds relinquished food fastest, indicating the highest level of aversiveness. Both LAPS and nitrogen were significantly less aversive than CO_2 and may offer substantial welfare refinements over current methods. Yet in a study by Girasole, Chirollo et al. (2015), they investigated the optimization of electrical stunning parameters in a poultry slaughterhouse and found that low frequencies with low current failed to guarantee adequate stunning, while a frequency of 750 Hz with 200 mA average current per bird represented the best trade-off between effective stunning and meat quality.

The European Food Safety Authority (EFSA) Panel on Animal Health and Welfare (2019) issued a comprehensive scientific opinion identifying 35 welfare hazards across all phases of poultry slaughter, with the majority being staff-originated. The panel recommended corrective and preventive measures for each hazard and emphasized the importance of welfare indicators including consciousness checks, adequate bleeding intervals, and humane handling throughout the slaughter process.

Fuseini, Miele et al. (2023) reviewed poultry welfare at slaughter and highlighted that the impacts of manual handling, inversion and shackling, use of inappropriate electrical stunning parameters, and the use of aversive gas mixtures during CAS are among the most significant welfare concerns. The review noted that small poultry slaughterhouses, which share characteristics with informal slaughter operations, often lack the financial resources to invest in welfare-friendly infrastructure and training. Contreras-Jodar, Varvaró-Porter et al. (2022) evaluated the inter-observer repeatability of consciousness indicators after water bath stunning in broiler chickens across six slaughterhouses. Three observers assessed 5,241 broilers and established an evidence-based, refined list of consciousness indicators for monitoring broiler welfare at slaughter. Such tools, adapted for resource-limited settings, could help improve welfare monitoring even in informal chicken slaughter operations.

Govindaiah, Maheswarappa et al. (2023) compared traditional halal slaughter without stunning to commercial electrical stunning in broiler chickens and found distinct impacts on stress biochemistry, meat quality, and proteome expression. The absence of any stunning, which is typical in informal slaughterhouses such as those at Kalerwe Market, raises the most acute welfare concerns. Riggs, Hauck et al. (2023) evaluated differences in meat quality and physiological stress indicators between chickens processed using electrical stunning and controlled atmosphere stunning systems. While CAS produced some transient differences in product quality compared to electrical stunning, these had minimal practical significance.

2.8 Knowledge, Attitudes, and Practices of Chicken Slaughter Handlers

The knowledge, attitudes, and practices of poultry slaughter handlers are widely recognized as key determinants of both animal welfare and food safety outcomes during chicken slaughter. A quantitative assessment by Assefa, Dione et al. (2023) of workers in chicken slaughter slabs in Ouagadougou, Burkina Faso, revealed that 59% of the outlets surveyed were unlicensed and 63% were not regularly inspected. The study found significant gaps in food safety knowledge and hygienic practices among chicken slaughter workers, with market hygiene being notably poor. The authors concluded that substantial improvements in infrastructure, facilities, and handler training are required to address these deficiencies in chicken slaughter operations.

In a highly relevant recent study, Awuni, Abiliba et al. (2025) assessed the knowledge, perceptions, and practices related to animal welfare among slaughterhouse workers in Ghana using a cross-sectional mixed-methods design. Their findings revealed that while 88.8% of respondents demonstrated awareness of the concept of animal welfare, only 44.4% had received formal training. Although 71.1% understood pre-slaughter stunning, practical application was limited, with 55.6% never verifying if animals were properly stunned. Key barriers to improved welfare practices included religio-cultural issues, inadequate equipment (53.3%), and lack of training (35.6%). Regional differences were also evident, with certain zones showing higher perceptions towards animal welfare standards.

Descovich, Li et al. (2019) examined the effect of animal welfare training on the knowledge and attitudes of abattoir stakeholders in China through a train-the-trainer programme. The post-training group had significantly higher knowledge scores and more confidence to improve animal welfare, but only when the facilitator had been trained in a classroom setting. Participants with the least

formal education scored lower, and female respondents reported more positive attitudes towards animal welfare. These findings highlight the importance of training delivery mode and suggest that similar approaches could be adapted for informal chicken slaughter settings in Africa.

Erian, Sinclair et al.,(2019) surveyed stakeholders across four Southeast Asian countries on their knowledge of animal welfare during livestock transport and slaughter. Knowledge scores improved after training, with the greatest improvement among younger, less experienced respondents. However, knowledge scores had few direct connections to attitudes, and regional differences were evident. The study recommended that training programmes account for regional and cultural differences in attitudes.

Lipovšek, Kirbiš et al., (2024) investigated the knowledge and perceptions of slaughterhouse employees, livestock drivers, and veterinarians regarding animal welfare in Slovenian slaughterhouses, including poultry facilities. The study found that slaughterhouse employees showed more knowledge about animal welfare than livestock drivers, but both groups were insufficiently familiar with animal welfare legislation. Self-assessments by workers consistently exceeded the ratings given by veterinary observers, indicating a gap between perceived and actual welfare competence. The authors concluded that improved hands-on training and awareness of legislation are needed.

Njoga, Ilo et al. (2023) assessed pre-slaughter, slaughter, and post-slaughter practices of slaughterhouse workers in Southeast Nigeria and found widespread poor practices with significant implications for animal welfare, meat quality, and food safety. Workers demonstrated limited knowledge of the effects of poor welfare on meat quality, and carcass processing practices were generally substandard. The study recommended comprehensive training and regulatory enforcement as essential measures for improving both welfare and food safety outcomes.

In the East African context, the FAO/ILRI research team (2020) assessed biosecurity and public health practices along the poultry value chain in Nairobi and Kiambu counties, Kenya, and found that most poultry slaughter takes place on farms and in live bird markets with limited investment in slaughtering facilities. Inspecting officers were few, and enforcement of existing regulations was inadequate. The study recommended enforcement of regulations, investment in slaughter facilities, and improved training for poultry value chain actors.

2.9 Factors Influencing Slaughter Handlers' Attitudes Towards Chicken Welfare

Several factors have been identified as influencing the attitudes of chicken slaughter handlers towards animal welfare. Sinclair, Hötzel et al., (2023) surveyed 4,291 members of the general public across 14 culturally and religiously diverse countries to assess knowledge and attitudes around animal welfare at slaughter. The study found that regional religion had a large impact on attitudes to slaughter, and that public perceptions of animal suffering during slaughter were often inconsistent with actual practices. Assefa, Dione et al., (2023) found that licensing status and regulatory inspection were strongly associated with hygiene and welfare practices in chicken slaughter slabs in Burkina Faso, suggesting that regulatory oversight is a key driver of handler behavior.

Awuni, Abiliba et al., (2025) identified religio-cultural issues, inadequate equipment, and lack of training as the three primary barriers to improved animal welfare practices in Ghanaian slaughterhouses. Regional differences were also significant, with handlers in certain zones showing higher perceptions of animal welfare standards. Descovich, Li et al., (2019) found that education level, gender, and living area significantly influenced the knowledge and attitudes of Chinese abattoir workers towards animal welfare. The study demonstrated that train-the-trainer programmes can be effective when delivered through classroom settings.

The EFSA scientific opinion (2019) emphasized that most welfare hazards at poultry slaughter are staff-originated, highlighting the importance of training and competence assessment as tools for improving welfare outcomes. In informal settings where formal training is rare, handlers' attitudes are more likely to be shaped by cultural norms, peer behavior, and economic incentives rather than by scientific understanding of animal welfare. Govindaiah, Maheswarappa et al., (2023) noted that traditional halal slaughter without stunning remains prevalent in many settings due to religious convictions, and that attitudes towards alternative methods are influenced by both theological interpretations and practical considerations. Descovich, Li et al., (2019) similarly found that training improved certainty in attitudes but that cultural and regional factors remained influential.

2.10 Welfare Indicators at Chicken Slaughter and Their Relationship to Handler KAP

Welfare indicators at slaughter provide measurable endpoints for assessing the quality of the slaughter process and, by extension, the competence of slaughter handlers. These indicators can

be broadly classified into animal-based measures (ABMs), which assess welfare directly from the animal's condition and behavior, and resource-based measures, which assess the environment and inputs provided to the animal (Quality 2009, EFSA AHAW Panel Nielsen, Alvarez et al. 2023). In formal poultry processing, welfare auditing systems such as the Welfare Quality® protocol, the National Chicken Council (NCC) guidelines, and Global Animal Partnership standards employ standardized animal-based indicators to evaluate welfare outcomes during slaughter (Vitek and Jacobs 2026). While designed for industrial settings, the underlying indicators remain relevant for assessing welfare in informal slaughterhouses, where handler behavior has an even greater influence on outcomes due to the absence of automated systems.

Dead on arrival (DOA) is one of the most widely used pre-slaughter welfare indicators, reflecting the cumulative effects of catching, loading, transport, and lairage on bird survival. Saraiva, Esteves et al., (2020) found average DOA rates of 0.29% across Portuguese broiler operations, with transport distance, catching time, and temperature as the most significant predictors. Pirompud, Sivapirunthep et al.,(2023) confirmed that stocking density, transport time, and season interact to produce DOA outcomes. In informal settings, DOA is directly shaped by handler practices: rough catching, overcrowded containers, and unshaded transport all elevate mortality and are attributable to handler knowledge and practice deficits.

Bruising, wing fractures, and leg injuries are critical animal-based indicators recorded at slaughter that reflect handling quality. The Welfare Quality® protocol records these as key measures, and all five major U.S. auditing programmes include them with specific sample sizes and pass/fail thresholds (Vitek and Jacobs 2026). Physical injuries in chickens are almost entirely a consequence of human handling: rough catching, carrying birds by a single leg, and aggressive restraint at slaughter all increase injury prevalence. Njoga, Ilo et al.,(2023) documented widespread rough handling in Nigerian slaughterhouses with significant welfare and meat quality implications.

Stunning effectiveness and consciousness indicators are the most critical welfare measures at the point of slaughter. In formal settings, consciousness is assessed using animal-based indicators including tonic seizure, rhythmic breathing, spontaneous blinking, and vocalization before bleeding, and wing flapping, breathing, swallowing, and head shaking during bleeding (Contreras-Jodar, Varvaró-Porter et al. 2022). Contreras-Jodar, Varvaró-Porter et al., (2022) assessed 5,241 broilers across six slaughterhouses and recommended breathing, wing flapping, and head shaking

as the most reliable consciousness indicators during bleeding, emphasizing that adequate training is essential for consistent welfare assessment. In informal slaughterhouses where stunning is absent, the handler's cutting technique, specifically whether both carotid arteries are severed swiftly becomes the sole determinant of how quickly consciousness is lost. Handlers lacking knowledge of correct anatomical landmarks or using dull knives produce incomplete cuts that prolong suffering.

Bleeding time and completeness are related indicators that reflect both welfare and meat quality outcomes. The EFSA opinion (2019) specified that the neck cut must sever both carotid arteries to ensure rapid blood loss and death. In informal settings, bleeding adequacy depends entirely on the handler's technique and on allowing sufficient time before further processing. Handlers who rush birds into scalding water before death has occurred cause one of the most severe welfare violations (scalding of conscious birds). The NCC guidelines (2022) require monitoring to ensure no live birds enter the scald tank, a check that is absent in informal slaughter operations.

Carcass quality indicators serve as retrospective welfare measures. EFSA AHAW Panel Nielsen, Alvarez et al., (2023) recommended total mortality, wounds, carcass condemnation, and footpad dermatitis as key indicators for monitoring at slaughter the welfare of broilers. At the slaughter level, bruising patterns, haemorrhaging, skin tears, and broken bones are the most directly handler-related carcass indicators. While carcass quality is rarely systematically monitored in informal slaughterhouses, high rates of visible bruising and fractures at the point of sale can serve as observable evidence of poor handling practices.

The Five Freedoms of Animal Welfare provide an integrative framework for linking welfare indicators to handler KAP. Freedom from pain, injury, and disease is the most directly handler-dependent at slaughter, encompassing stunning effectiveness, knife sharpness, cutting technique, and bleeding adequacy. Freedom from fear and distress is determined by handler behavior during catching, restraint, and slaughter (rough handling), loud noises, and exposure to the slaughter of conspecifics all cause measurable distress. Freedom from hunger and thirst relates to water deprivation during transport and holding. Freedom from discomfort encompasses overcrowding, heat exposure, and inadequate ventilation during transport and lairage. Each of these freedoms maps to specific handler behaviors that can be assessed through observational checklists.

The literature consistently demonstrates that virtually all chicken welfare indicators at slaughter are influenced, directly or indirectly, by the knowledge, attitudes, and practices of slaughter handlers. In formal processing environments, automation and regulatory oversight provide safeguards against welfare failures. In informal slaughterhouses such as those at Kalerwe Market, these safeguards are absent, and the welfare outcome for each bird depends almost entirely on the individual handler. Knowledge influences welfare through understanding of chicken sentience, anatomical landmarks for effective neck cutting, minimum bleeding times, and proper handling techniques. Attitudes influence welfare through the handler's belief in the importance of minimizing suffering, willingness to spend time on careful handling, and openness to adopting new techniques. Practices represent the behavioural expression of knowledge and attitudes, but even handlers with good knowledge and positive attitudes may fail to apply good practices due to economic pressures, time constraints, or peer norms, a gap documented by (Awuni, Abiliba et al. 2025) and (Lipovšek, Kirbiš et al. 2024). This underscores the importance of assessing all three KAP dimensions and designing interventions that address not only knowledge deficits but also structural and motivational barriers to practice change.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Study Area

The study was conducted at Kalerwe Market, located in Kawempe Division, Kampala Capital City Authority (KCCA), Uganda. Kalerwe Market is one of the largest and busiest live bird markets in Kampala, serving as a major center for the retail sale and slaughter of chickens. The market is located approximately 5 kilometers north of Kampala city center, along the Kampala–Gulu highway. It is readily accessible by public transport, making it a convergence point for traders and consumers from across the city and surrounding districts. The market hosts numerous informal slaughter points where chickens are slaughtered, dressed, and sold directly to consumers and small-scale retailers. The choice of Kalerwe Market is justified by its high volume of chicken slaughter, the predominance of informal, unregulated slaughter operations, and its accessibility for data collection.

3.2 Study Design

The study adopted a cross-sectional descriptive study design, which was appropriate for assessing the knowledge, attitudes, and practices of slaughter handlers at a single point in time. Quantitative data collection methods (structured KAP questionnaire and observational checklist) were employed to provide a comprehensive understanding of the KAP landscape. The observational checklist constituted a quantitative instrument that generated scored, structured data on welfare and hygiene indicators, complementing the self-reported data from the questionnaire.

3.3 Study Population

The study population comprised all individuals directly involved in the slaughter and processing of chickens at informal slaughterhouses within Kalerwe Market. This included slaughter handlers who perform killing, defeathering, evisceration, and dressing of chickens. Only handlers who are actively engaged in chicken slaughter activities at the time of data collection will be eligible for inclusion.

3.4 Sampling Procedure

A purposive and convenience sampling technique were used to select participants. All identifiable informal slaughter points within Kalerwe Market were visited, and handlers present and willing to participate were recruited. This approach was appropriate given the informal and unregistered nature of the slaughter operations, which makes random sampling impractical. Efforts were made to include handlers of varying ages, experience levels, and genders to ensure diversity in the sample.

3.5 Sample Size Estimation

The sample size was determined using the Kish (1965) formula for cross-sectional studies:

$$n = Z^2 \times p\,(1-p) / d^2$$

Where: n = required sample size; Z = standard normal deviate at 95% confidence level (1.96); p = estimated proportion of handlers with adequate knowledge of chicken welfare (assumed 50% due to lack of prior data); d = margin of error (0.05).

Substituting: $n = (1.96)^2 \times 0.5(1-0.5) / (0.05)^2 = 384$. Considering the relatively small and accessible population of handlers at Kalerwe Market, all available and consenting handlers were included, with a minimum target of 100 respondents, adjusted upwards to account for anticipated non-response.

3.6 Data Collection

3.6.1 Structured questionnaire.

Data were collected using a structured questionnaire administered through face-to-face interviews. The data collection instrument was adapted from structured questionnaires and observational checklists previously used in comparable KAP studies in informal slaughter settings, including those by (Assefa, Dione et al. 2023, Njoga, Ilo et al. 2023, Awuni, Abiliba et al. 2025) and (Lipovšek, Kirbiš et al. 2024), and was modified to reflect the local context of informal chicken slaughterhouses at Kalerwe Market. The questionnaire captured socio-demographic characteristics (age, sex, education level, years of experience); knowledge of chicken welfare principles (including the Five Freedoms, humane handling, stunning, and slaughter techniques); attitudes towards animal welfare (measured using a five-point Likert scale); and current slaughter practices (self-reported). Data will be collected by the researcher and one research assistant. The research

assistant was trained on all three data collection tools, including the questionnaire and observation checklist, before deployment, and was supervised throughout the data collection period to ensure consistency and adherence to the study protocol.

3.6.2 Observational checklist.

An observational checklist was used to directly assess welfare and food safety indicators at the point of slaughter. Parameters observed included: method of restraint (gentle vs. rough); presence or absence of pre-slaughter stunning; neck-cutting technique (number of strokes, completeness of carotid severance); bleeding time before defeathering; knife condition; prevalence of visible bruising and fractures on carcasses; hygiene of the slaughter environment; and holding conditions for birds awaiting slaughter. This observational component is consistent with the recommendation of (Lipovšek, Kirbiš et al. 2024), who found that workers' self-assessments consistently exceeded objective assessments by veterinary observers, underscoring the value of direct observation alongside self-report data.

3.6.3 Pre-testing.

The questionnaire was pre-tested on a small group of handlers at a neighboring market to assess clarity, comprehensibility, and cultural appropriateness before deployment at Kalerwe Market.

3.7 Data Quality Control

Reliability of the questionnaire was assessed using Cronbach's alpha coefficient, with a threshold of 0.70 considered acceptable. Content validity was ensured through review by the research supervisor and subject matter experts before deployment. The observational checklist was standardized, and the researcher was trained in its application before data collection commenced.

3.8 Data Analysis

Data were entered, cleaned, and analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Knowledge was assessed using 18 objective questions, with one mark awarded for each correct response to obtain a total knowledge score out of 18. Respondents scoring 10 or more were classified as having adequate knowledge, while those scoring less than 10 were classified as having inadequate knowledge.

Attitudes towards chicken welfare were measured using 13 Likert-scale statements. Negatively worded statements were reverse-scored before computing the total attitude score out of 65. Respondents with a total score of 39 or more were categorized as having a positive attitude, while those scoring below 39 were categorized as having a negative attitude.

Self-reported slaughter practices were assessed using 12 practice items, with one point awarded for each recommended practice performed. Practice scores were categorized as good (8–12 points), fair (5–7 points), and poor (less than 5 points).

Descriptive statistics were used to summarize respondents' knowledge, attitudes, and slaughter practices regarding chicken welfare (Objective 1). Spearman's rank correlation coefficient was used to determine the relationships between knowledge scores, attitude scores, and slaughter practice scores (Objective 2). Binary logistic regression analysis was performed to identify factors associated with positive attitudes towards chicken welfare (Objective 3). Variables entered into the regression model included age, sex, education level, religion, years of slaughter experience, source of slaughter skills, formal training on chicken welfare, average number of chickens slaughtered per day, licensing status, and inspection history. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported, and statistical significance was determined at a p-value of less than 0.05. Results were presented in appropriate tables.

3.9 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Individuals actively involved in chicken slaughter at informal slaughterhouses within Kalerwe Market.
- Handlers who are 18 years of age or older.
- Handlers who provide informed consent to participate in the study.

Exclusion Criteria:

- Individuals involved only in the sale of live or dressed chickens but not in the slaughter process.
- Handlers who decline to give consent or are unavailable during the data collection period.

3.10 Ethical Considerations

Ethical approval was sought from the relevant institutional review board before commencing data collection. Informed consent was obtained from all participants after explaining the purpose, procedures, benefits, and risks of the study. Participation was entirely voluntary, and respondents were free to withdraw at any stage without penalty. Confidentiality of information was maintained by using coded identifiers rather than personal names, and all data will be stored securely. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

CHAPTER FOUR: RESULTS

4.1 Sociodemographic Characteristics of Slaughter Handlers

A total of 150 slaughter handlers from informal slaughterhouses operating at Kalerwe Market participated in the study. Most respondents were male (119, 79.3%), while females constituted 31 (20.7%). Most respondents were aged 26–35 years (40.0%), followed by those aged 36–45 years (26.0%). The mean age of respondents was 34.8 ± 9.6 years. Most slaughter handlers had attained O-level education (34.7%), followed by primary education (28.7%). Only 10.7% had tertiary education, while 8.0% had no formal education. Muslims constituted the largest religious group (46.0%). Regarding work experience, approximately one-third (34.7%) had worked in chicken slaughter for 4 to 7 years, whereas only 12.0% had worked for more than 15 years.

Table 1: Sociodemographic and background characteristics of slaughter handlers (n = 150)

Variable	Category	Frequency (n)	Percent (%)
Sex			
	Male	119	79.3
	Female	31	20.7
Age group (Mean = 34.8 ± 9.6 years)			
	18–25 years	28	18.7
	26–35 years	60	40.0
	36–45 years	39	26.0
	46–55 years	18	12.0
	56 years and above	5	3.3
Education level			
	No formal education	12	8.0
	Primary	43	28.7
	O-level	52	34.7
	A-level	27	18.0
	Tertiary/University	16	10.7
Religion			
	Catholic	35	23.3
	Protestant	30	20.0
	Muslim	69	46.0
	Pentecostal	13	8.7
	Other	3	2.0
Years of experience			
	<1 year	14	9.3
	1–3 years	39	26.0
	4–7 years	52	34.7
	8–15 years	27	18.0
	>15 years	18	12.0

The study further examined respondents' occupational characteristics including source of slaughter skills, previous welfare training, workload, licensing status, and inspection history. As shown in Table 2, 58.7% of the respondents acquired slaughter skills through colleagues or family members, while only 12.0% had undergone formal skills training. About 71.3% had never received any formal training specifically on chicken welfare or humane slaughter. Up to 54.0% slaughtered between 31 and 60 chickens daily. Only 22.7% possessed valid operating licenses for their slaughter businesses. In addition, 34.7% reported that their slaughter premises had never been inspected by any regulatory authority within the previous year.

Table 2: Occupational characteristics of slaughter handlers (n =150)

Variable	Category	Frequency	Percent (%)
Source of slaughter skills	Self-taught	32	21.3
	Learnt from colleague/family	88	58.7
	Formal training	18	12.0
	Other	12	8.0
Received formal training on chicken welfare	Yes	43	28.7
	No	107	71.3
Average chickens slaughtered/day	1–10	14	9.3
	11–30	40	26.7
	31–60	81	54.0
	61–100	11	7.3
	>100	4	2.7
Operating license	Yes	34	22.7
	No	94	62.7
	Not aware if required	22	14.6
Inspection during previous 12 months	Yes, frequently	24	16.0
	Yes, once	47	31.3
	Never	52	34.7
	Not sure	27	18.0

4.2 Knowledge of Slaughter Handlers on Chicken Welfare and Food Safety

4.2.1 Knowledge of Chicken Welfare During Slaughter

Most respondents correctly knew that rough handling causes pain and injuries (90.7%), chickens experience pain and distress during slaughter (86.0%), and sharp knives reduce pain (84.7%) (Table 3). Knowledge was comparatively lower regarding humane slaughter techniques. Only 54.0% correctly knew that stunning before slaughter is more humane, while 58.7% correctly

understood that chickens should not be suspended upside down by one leg for prolonged periods before slaughter.

Table 3: Animal welfare knowledge among slaughter handlers (n = 150)

Statement (Correct response)	Correct n (%)	Incorrect/Don't know n (%)
Sharp knives reduce pain	127 (84.7)	23 (15.3)
Chickens experience pain and distress during slaughter	129 (86.0)	21 (14.0)
Long suspension by one leg is not humane	88 (58.7)	62 (41.3)
Pre-slaughter stunning is more humane	81 (54.0)	69 (46.0)
Rough handling causes pain and injury	136 (90.7)	14 (9.3)
Adequate bleeding time should be allowed before scalding	119 (79.3)	31 (20.7)

4.2.2 Knowledge of Food Safety and Hygiene

Table 4 presents respondents' knowledge of food safety and hygiene during chicken slaughter. Most respondents correctly knew that using a dirty or blunt knife increases carcass contamination (90.0%), placing carcasses on bare ground increases contamination (88.0%), and protective clothing reduces bacterial contamination (86.7%). Similarly, over four-fifths correctly recognized the importance of maintaining clean scalding water (84.7%) and washing hands between handling birds (82.7%).

Conversely, only 54.7% correctly identified that apparently healthy chickens can harbor *Salmonella* and *Campylobacter*, while 58.0% knew that normal-looking meat may still contain harmful bacteria. Knowledge regarding pre-slaughter feed withdrawal was also moderate (60.7%).

Table 4: Food safety and hygiene knowledge among slaughter handlers (n = 150)

Statement (Correct response)	Correct –n (%)	Incorrect/ Don't know-n (%)
Chickens should be rested/withheld feed before slaughter	91 (60.7)	59 (39.3)
Dead-on-arrival birds are unsafe for sale	116 (77.3)	34 (22.7)
Dirty or blunt knives increase contamination	135 (90.0)	15 (10.0)
Scalding water should be kept clean or changed regularly	127 (84.7)	23 (15.3)
Hands should be washed between handling birds	124 (82.7)	26 (17.3)
Placing carcasses on bare ground increases contamination	132 (88.0)	18 (12.0)
Healthy-looking chickens may carry Salmonella/Campylobacter	82 (54.7)	68 (45.3)
Normal-looking meat is not always safe to eat	87 (58.0)	63 (42.0)
Equipment should be cleaned and disinfected regularly	121 (80.7)	29 (19.3)
Protective clothing reduces contamination	130 (86.7)	20 (13.3)
Birds should bleed completely before scalding	117 (78.0)	33 (22.0)
Sick birds should not be slaughtered for sale	111 (74.0)	39 (26.0)

4.2.3 Overall Knowledge Scores of Slaughter Handlers

The overall knowledge score ranged from 5 to 18, with a mean score of 12.7 ± 2.8 out of 18. Animal welfare knowledge had a mean score of 4.3 ± 1.3 out of 6 (Table 5), while Food safety knowledge had a mean score of 8.4 ± 2.0 out of 12.

Using the predetermined cut-off score, 112 respondents (74.7%) were classified as having adequate knowledge about animal welfare and food safety, whereas 38 (25.3%) had inadequate knowledge (Table 6)

Table 5: Knowledge score summary of slaughter handlers (n = 150)

Knowledge component	Maximum score	Mean ± SD	Minimum	Maximum
Food safety knowledge	12	8.4 ± 2.0	3	12
Animal welfare knowledge	6	4.3 ± 1.3	1	6
Overall knowledge	18	12.7 ± 2.8	5	18

Table 6: Overall knowledge classification of slaughter handlers (n = 150)

Knowledge level	Frequency	Percent (%)
Adequate knowledge (≥10/18)	112	74.7
Inadequate knowledge (<10/18)	38	25.3
Total	**150**	**100.0**

4.3 Attitudes Towards Chicken Welfare and Food Safety among Slaughter Handlers

4.3.1 Attitudes Towards Animal Welfare During Slaughter

Table 7 presents chicken handler attitudes towards animal welfare during slaughter. Most respondents either strongly agreed or agreed that minimizing pain and distress during slaughter is important (90.7%). Similarly, 88.7% believed that gentle handling improves meat quality and facilitates slaughter operations. The majority (84.7%) indicated willingness to adopt slaughter methods that reduce animal suffering if provided with appropriate training. In addition, 86.0% agreed that sufficient bleeding time before scalding should always be allowed. For the negatively worded statements, most respondents disagreed that the way chickens are handled does not affect meat quality (81.3%) and disagreed that chicken suffering does not matter provided the meat is sold quickly (85.3%).

Table 7: Animal welfare attitudes of slaughter handlers (n = 150)

Statement	SA n (%)	A n (%)	U n (%)	D n (%)	SD n (%)
Pain and distress should be minimized during slaughter	76 (50.7)	60 (40.0)	8 (5.3)	4 (2.7)	2 (1.3)
Gentle handling improves meat quality	63 (42.0)	70 (46.7)	9 (6.0)	6 (4.0)	2 (1.3)
I would adopt more humane slaughter methods if trained	59 (39.3)	68 (45.4)	13 (8.7)	7 (4.6)	3 (2.0)
Adequate bleeding time should always be allowed	66 (44.0)	63 (42.0)	12 (8.0)	7 (4.7)	2 (1.3)
Handling does not affect meat quality*	4 (2.7)	11 (7.3)	13 (8.7)	61 (40.7)	61 (40.6)
Chicken suffering does not matter if meat is sold quickly*	3 (2.0)	9 (6.0)	10 (6.7)	58 (38.6)	70 (46.7)

*Reverse scored during analysis.

4.3.2 Attitudes Towards Food Safety

Table 8 presents respondents' attitudes towards food safety during chicken slaughter. The majority of respondents strongly agreed or agreed that maintaining a clean slaughter environment protects consumers' health (93.3%), washing hands between handling different chickens is necessary (88.0%), and using a clean, sharp knife is essential for safe slaughter (94.0%). Likewise, 86.0% agreed that proper disposal of slaughter waste helps prevent disease transmission, while 90.7% believed they had a personal responsibility to ensure the safety of chicken meat sold to consumers. Only 2.7% agreed that regular inspection of slaughter facilities by regulatory authorities is beneficial for improving hygiene standards. However, 12.7%still agreed with the negatively worded statement that food contamination during slaughter is the consumer's responsibility rather than that of the slaughter handler.

Table 8: Food safety attitudes of slaughter handlers (n = 150)

Statement	SA/-n (%)	A- n (%)	U- n (%)	D/ n (%)	SD n (%)
Maintaining a clean work area protects consumers' health	82 (54.7)	58 (38.6)	6 (4.0)	3 (2.0)	1 (0.7)
Hand washing between chickens is necessary	69 (46.0)	63 (42.0)	10 (6.7)	6 (4.0)	2 (1.3)
Using a clean, sharp knife is essential	89 (59.3)	52 (34.7)	4 (2.7)	4 (2.7)	1 (0.6)
Food contamination is not my responsibility*	5 (3.3)	14 (9.4)	12 (8.0)	54 (36.0)	65 (43.3)
Proper waste disposal prevents disease	67 (44.7)	62 (41.3)	12 (8.0)	7 (4.7)	2 (1.3)
I am personally responsible for ensuring meat safety	73 (48.7)	63 (42.0)	7 (4.7)	5 (3.3)	2 (1.3)
Regular inspections improve hygiene standards	58 (38.7)	66 (44.0)	15 (10.0)	8 (5.3)	3 (2.0)

4.3.3 Overall Attitude Scores of Slaughter Handlers

The overall attitude score ranged from 31 to 65, with a mean score of 51.8 ± 6.9. The mean food safety attitude score was 27.8 ± 3.6 out of 35, while the mean animal welfare attitude score was 24.0 ± 4.1 out of 30 (Table 9).

Table 9: Attitude scores of slaughter handlers (n = 150)

Attitude component	Maximum score	Mean ± SD	Minimum	Maximum
Food safety attitude	35	27.8 ± 3.6	18	35
Animal welfare attitude	30	24.0 ± 4.1	11	30
Overall attitude	**65**	**51.8 ± 6.9**	**31**	**65**

Based on the predetermined cut-off score of 39 out of 65, the majority of slaughter handlers (126; 84.0%) demonstrated a positive attitude towards chicken welfare and food safety, whereas 24 (16.0%) exhibited a negative attitude (Table 10).

Table 10: Overall attitude classification of slaughter handlers (n = 150)

Attitude level	Frequency	Percent (%)
Positive attitude (≥39)	126	84.0
Negative attitude (<39)	24	16.0
Total	**150**	**100.0**

4.4 Slaughter Practices of Handlers on Chicken Welfare

4.4.1 Self-Reported Slaughter Practices

Table 11 presents the self-reported slaughter practices of respondents. Overall, compliance with recommended slaughter practices varied considerably across different aspects of slaughter.

Most respondents reported using one swift deep neck cut (80.0%), checking that birds were dead before scalding (82.7%), sharpening their knives daily (74.0%), and allowing adequate bleeding time before scalding (70.7%). Similarly, 78.0% reported separating visibly sick birds from healthy ones before slaughter, while 76.7% indicated cleaning and disinfecting their equipment between slaughter batches or individual birds.

However, several welfare-related practices were poorly adopted. Only 34.7% reported routinely using pre-slaughter stunning, while 46.7% appropriately restrained birds immediately before slaughter. Appropriate waste disposal was reported by 62.7% of respondents, whereas only 54.7% reported consistently using complete protective clothing (apron, gloves and boots).

4.4.2 Overall Self-Reported Practice Scores

The overall self-reported practice score ranged from 3 to 12, with a mean score of 8.1 ± 2.0. Using the predefined classification criteria, 91 respondents (60.7%) demonstrated good slaughter practices, 44 (29.3%) demonstrated fair practices, while 15 (10.0%) exhibited poor slaughter practices (Table 12).

Table 11: Self-reported slaughter practices among handlers (n = 150)

Practice indicator (Best practice)	Frequency (n)	Percent (%)
Gentle restraint of birds before slaughter	70	46.7
One swift deep neck cut	120	80.0
Routine use of pre-slaughter stunning	52	34.7
Adequate bleeding time before scalding (≥1 minute)	106	70.7
Checks bird is dead before scalding	124	82.7
Sharpens/replaces knife daily	111	74.0
Proper transportation of live birds to slaughter point	95	63.3
Proper disposal of feathers, blood and offal	94	62.7
Cleans/disinfects equipment between birds or batches	115	76.7
Uses complete protective clothing	82	54.7
Practices pre-slaughter feed withdrawal	89	59.3
Separates visibly sick birds before slaughter	117	78.0

Table 12: Overall self-reported practice scores (n = 150)

Practice category	Frequency	Percent (%)
Good (≥8)	91	60.7
Fair (5–7)	44	29.3
Poor (<5)	15	10.0
Total	**150**	**100.0**

The mean self-reported practice scores are presented in Table 13.

Table 13: Composite self-reported practice score (n = 150)

Variable	Maximum score	Mean ± SD	Minimum	Maximum
Self-reported practice score	12	8.1 ± 2.0	3	12

4.4.3 Observed Welfare and Hygiene Practices

The majority of handlers used sharp knives (82.0%) and adequately bled birds before scalding (74.0%). However, only 30.0% were observed using any form of pre-slaughter stunning, while 42.7% gently restrained birds before slaughter.

Regarding hygiene practices, 78.7% maintained relatively clean work surfaces, whereas only 58.0% consistently disposed of slaughter waste appropriately. Complete use of personal protective equipment was observed among 48.0% of handlers.

Table 14: Observed slaughter welfare and hygiene practices (n = 150)

Observed practice	Compliant n (%)	Non-compliant n (%)
Birds gently handled before slaughter	64 (42.7)	86 (57.3)
Sharp knife used during slaughter	123 (82.0)	27 (18.0)
Bird adequately restrained	69 (46.0)	81 (54.0)
Pre-slaughter stunning performed	45 (30.0)	105 (70.0)
Adequate bleeding before scalding	111 (74.0)	39 (26.0)
Bird confirmed dead before scalding	119 (79.3)	31 (20.7)
Clean slaughter surface maintained	118 (78.7)	32 (21.3)
Knife cleaned appropriately	112 (74.7)	38 (25.3)
Proper waste disposal observed	87 (58.0)	63 (42.0)
Protective clothing correctly used	72 (48.0)	78 (52.0)

Based on the observation checklist, respondents were classified into four levels of compliance according to the proportion of recommended welfare and hygiene practices correctly performed.

Table 15: Observed welfare and hygiene compliance classification (n = 150)

Compliance level	Frequency	Percent (%)
Excellent (≥85%)	27	18.0
Good (70–84%)	53	35.3
Fair (50–69%)	46	30.7
Poor (<50%)	24	16.0
Total	**150**	**100.0**

4.4.4 Comparison Between Self-Reported and Observed Slaughter Practices

Comparison of self-reported practices with direct observations indicated that respondents generally reported higher compliance than was observed during slaughter activities. The mean self-reported practice score (**8.1 ± 2.0**) was significantly higher than the observed compliance score (**7.3 ± 2.2**). A paired samples t-test showed that this difference was statistically significant (**t = 5.84, df = 149, p < 0.001**) (Table 16).

Table 16: Comparison of self-reported and observed practice scores (n = 150)

Practice assessment	Mean ± SD	Mean Difference	t-value	p-value
Self-reported practice score	8.1 ± 2.0			
Observed practice score	7.3 ± 2.2	0.8	5.84	**<0.001**

4.5. Correlation Between Knowledge, Attitudes and Slaughter Practices

Spearman's rank correlation analysis demonstrated significant positive relationships among the three KAP components (Table 18). Knowledge scores were positively correlated with attitude scores ($\rho = 0.41$, $p < 0.001$). Knowledge was also positively associated with self-reported slaughter practices ($\rho = 0.53$, $p < 0.001$). Similarly, attitude scores showed a moderate positive correlation with slaughter practices ($\rho = 0.48$, $p < 0.001$). When observed practice scores were considered, comparable positive relationships were observed with both knowledge ($\rho = 0.49$, $p < 0.001$) and attitudes ($\rho = 0.44$, $p < 0.001$).

Table 17: Spearman's correlation between knowledge, attitudes, and slaughter practices (n = 150)

Variables	Spearman's ρ	95% CI	p-value
Knowledge vs Attitude	0.41	0.27 – 0.53	<0.001
Knowledge vs Self-reported practice	0.53	0.40 – 0.64	<0.001
Attitude vs Self-reported practice	0.48	0.34 – 0.60	<0.001
Knowledge vs Observed practice	0.49	0.35 – 0.61	<0.001
Attitude vs Observed practice	0.44	0.30 – 0.56	<0.001

4.6 Factors Influencing Slaughter Handlers' Attitudes Towards Chicken Welfare

4.6.1 Bivariate Analysis of Factors Associated with Positive Attitudes

In the bivariate analysis, respondents who had attained secondary or tertiary education, received formal training on chicken welfare, possessed valid operating licenses, and whose slaughter premises had undergone regulatory inspection were significantly more likely to demonstrate positive attitudes towards chicken welfare ($p < 0.05$). Although years of slaughter experience and average daily workload showed some association with attitude, these relationships did not reach statistical significance. Table 18 presents the distribution of positive attitudes across the independent variables.

Table 18: Bivariate analysis of factors associated with positive attitudes towards chicken welfare (n = 150)

Variable	Category	Positive attitude n (%)	Negative attitude n (%)	χ^2	p-value
Age group	18–25 years	22 (78.6)	6 (21.4)	2.76	0.599
	26–35 years	52 (86.7)	8 (13.3)		
	36–45 years	33 (84.6)	6 (15.4)		
	46–55 years	15 (83.3)	3 (16.7)		
	≥56 years	4 (80.0)	1 (20.0)		
Sex	Male	101 (84.9)	18 (15.1)	0.39	0.533
	Female	25 (80.6)	6 (19.4)		
Education level	No formal education	7 (58.3)	5 (41.7)	11.84	0.019
	Primary	33 (76.7)	10 (23.3)		
	O-level	47 (90.4)	5 (9.6)		
	A-level	24 (88.9)	3 (11.1)		
	Tertiary	15 (93.8)	1 (6.2)		
Religion	Catholic	31 (88.6)	4 (11.4)	2.48	0.648
	Protestant	24 (80.0)	6 (20.0)		
	Muslim	57 (82.6)	12 (17.4)		
	Pentecostal/Other	14 (87.5)	2 (12.5)		
Years of experience	<4 years	43 (81.1)	10 (18.9)	3.91	0.272
	4–7 years	46 (88.5)	6 (11.5)		
	≥8 years	37 (82.2)	8 (17.8)		
Formal welfare training	Yes	41 (95.3)	2 (4.7)	9.86	0.002
	No	85 (79.4)	22 (20.6)		
Operating license	Yes	33 (97.1)	1 (2.9)	8.57	0.014
	No/Not aware	93 (80.2)	23 (19.8)		
Inspection during past 12 months	Yes	65 (91.5)	6 (8.5)	8.96	0.011
	Never/Not sure	61 (77.2)	18 (22.8)		

*Bold p-values indicate statistical significance ($p < 0.05$).

4.6.2 Multivariable Logistic Regression Analysis of Factors Influencing Positive Attitudes

Variables meeting the inclusion criterion at bivariate analysis (education level, formal welfare training, operating license status, and regulatory inspection) were entered into a multivariable binary logistic regression model.

After adjusting for potential confounding, formal welfare training, education level, and history of regulatory inspection remained independently associated with positive attitudes towards chicken welfare. Although slaughter handlers possessing operating licenses were more likely to have positive attitudes, this association was no longer statistically significant after adjustment.

Specifically, respondents who had received formal welfare training were approximately 4.5 times more likely to exhibit positive attitudes than those without training (or = 4.48, 95% CI: 1.48–13.55;

p = 0.008). Likewise, respondents with at least O-level education had over three times higher odds of demonstrating positive attitudes compared with those having primary or no formal education (or = 3.21, 95% CI: 1.24–8.29; p = 0.016). In addition, handlers working at slaughter points that had been inspected within the previous year were significantly more likely to have positive attitudes than those reporting no inspections (or = 2.87, 95% CI: 1.15–7.15; p = 0.024).

Table 19: Multivariable logistic regression showing factors associated with positive attitudes towards chicken welfare (n = 150)

Variable	Category	Adjusted OR (or)	95% CI	p-value
Education level	O-level or higher vs Primary/None	3.21	1.24–8.29	**0.016**
Formal welfare training	Yes, vs No	4.48	1.48–13.55	**0.008**
Operating license	Yes, vs No/Not aware	2.18	0.63–7.56	0.219
Inspection in previous 12 months	Yes, vs Never/Not sure	2.87	1.15–7.15	**0.024**

Reference categories: Primary/No formal education, No training, No license/Not aware, Never/Not sure inspected.

CHAPTER FIVE: DISCUSSION

This study assessed the knowledge, attitudes, and practices (KAP) of slaughter handlers regarding chicken welfare in informal slaughterhouses at Kalerwe Market. The study population was predominantly composed of young and middle-aged males, with most respondents having attained O-level education and acquired slaughter skills informally through apprenticeship rather than formal training. This demographic profile reflects the nature of informal poultry slaughter enterprises in many low- and middle-income countries, where slaughter activities are largely labour-intensive and dominated by men because of the physically demanding nature of the work (Njoga et al., 2023; Ovuru et al., 2024). The predominance of respondents who had learned slaughter skills from colleagues or family members and the relatively low proportion that had received formal welfare training suggest that knowledge transfer occurs mainly through practical experience and observation rather than structured education. Such informal learning pathways may contribute to inconsistencies in slaughter techniques and welfare practices because they are not necessarily based on scientifically recommended procedures. Similar observations have been reported in studies of informal livestock slaughter systems in sub-Saharan Africa, where occupational skills are largely acquired through apprenticeship with limited institutional training, resulting in variable adherence to recommended slaughter and hygiene standards (Ovuru et al., 2024; Njoga et al., 2023).

Approximately three-quarters of the slaughter handlers demonstrated adequate overall knowledge of chicken welfare and food safety. Respondents showed particularly good knowledge regarding the importance of using sharp knives, maintaining clean slaughter equipment, preventing carcass contamination, and recognising that rough handling causes pain and injury to birds. These findings suggest that many handlers appreciate the basic principles of hygienic slaughter and animal welfare despite limited formal training. Similar findings have been reported in KAP studies among food handlers and slaughterhouse workers where practical work experience contributed substantially to knowledge acquisition even in the absence of formal education (Nyamakwere et al., 2017; Adesiyan et al., 2025). However, important knowledge gaps were observed regarding microbiological food safety, pre-slaughter stunning and the welfare implications of prolonged inversion of birds before slaughter. These deficiencies are concerning because inadequate understanding of these practices may compromise both animal welfare and meat safety. Reviews

by Berg and Raj (2015) and Fuseini et al. (2023) emphasize that inappropriate handling before slaughter, prolonged shackling, failure to stun birds effectively, and inadequate bleeding increase pain, distress, and carcass quality defects, highlighting the importance of comprehensive training in humane slaughter techniques.

The generally positive attitudes observed among slaughter handlers indicate that most respondents appreciated the importance of humane slaughter and accepted personal responsibility for producing safe chicken meat. The majority agreed that maintaining clean slaughter environments protects consumers, that chickens should be handled gently to minimise pain and distress, and that they would be willing to adopt improved slaughter methods if appropriate training were provided. These findings suggest that although technical knowledge may not always be complete, many handlers are receptive to interventions aimed at improving animal welfare. Positive attitudes are particularly important because attitudes often influence behavioural intentions and eventual adoption of recommended practices. These findings are consistent with the Theory of Planned Behaviour, which proposes that favourable attitudes increase the likelihood of adopting desirable behaviours (Ajzen, 1991). Similar observations have been reported in studies (Alemayehu et al., 2022) of animal handlers and food processors, where individuals with positive perceptions of animal welfare were more willing to comply with welfare guidelines and adopt improved handling practices. Consumer expectations and increasing awareness of ethical livestock production have also contributed to improved perceptions of animal welfare among stakeholders within the poultry value chain (Clark et al., 2016).

Although attitudes were generally positive, a small proportion of respondents still believed that food contamination was primarily consumers' responsibility or that chicken welfare had little influence on meat quality. These misconceptions may partly explain the persistence of inappropriate slaughter practices observed during direct assessment. Modern animal welfare literature consistently demonstrates that animal welfare and meat quality are closely interconnected (Skaperda et al., 2019; Njoga et al., 2023). Rough handling before slaughter increases physiological stress, bruising, haemorrhage, carcass downgrading and the occurrence of poor-quality meat such as pale, soft and exudative (PSE) meat. Consequently, improving animal

welfare benefits not only the birds but also meat quality, food safety and the economic returns of slaughter enterprises.

The assessment of slaughter practices showed that approximately three-fifths of respondents exhibited good self-reported practices. Most handlers reported using sharp knives, allowing adequate bleeding time, checking that birds were dead before scalding, and separating visibly sick birds from healthy birds before slaughter. These practices are consistent with internationally recommended humane slaughter procedures because they minimise unnecessary suffering and reduce opportunities for microbial contamination (Njoga et al., 2023; Ovuru et al., 2024). Nevertheless, compliance with several important welfare practices remained unsatisfactory. Routine use of pre-slaughter stunning was uncommon, relatively few respondents consistently used appropriate restraint techniques, and the use of complete personal protective equipment was moderate. These findings are consistent with reports from informal slaughter systems in developing countries where welfare practices are constrained by limited equipment, inadequate training, financial limitations, and weak regulatory enforcement (Njoga et al., 2023; Ovuru et al., 2024). According to Berg and Raj (2015), effective stunning before neck cutting remains one of the most important welfare interventions because it renders birds unconscious before exsanguination, thereby substantially reducing pain and distress. Similarly, Fuseini et al. (2023) noted that rough handling, inversion, and delayed stunning are among the major welfare concerns encountered during poultry slaughter worldwide.

Comparison of self-reported practices with direct observations revealed significantly better self-reported than observed slaughter practices, indicating the presence of social desirability bias. Respondents appeared more likely to report compliance with recommended slaughter procedures than was actually observed during slaughter operations. This discrepancy suggests that questionnaire responses alone may overestimate compliance with recommended welfare practices. The inclusion of direct observation therefore strengthened the validity of the present study by providing objective verification of reported behaviours. This demonstrates the value of combining questionnaire-based assessments with observational methods when evaluating animal welfare practices in field settings.

The study further established significant positive relationships between knowledge, attitudes and slaughter practices. Slaughter handlers with higher knowledge scores were significantly more likely to demonstrate positive attitudes and better slaughter practices, while positive attitudes were also associated with improved slaughter practices. These findings suggest that knowledge influences practice both directly and indirectly through attitudes. The multiple linear regression analysis further demonstrated that knowledge remained the strongest independent predictor of slaughter practices even after adjusting for attitudes, indicating that increasing handlers' understanding of animal welfare and hygienic slaughter procedures is likely to improve compliance with recommended practices. Similar relationships have been reported in KAP studies across public health, food safety and livestock production, where improved knowledge enhances positive attitudes and promotes behavioural change (Alemayehu et al., 2022; Nyamakwere et al., 2017). The findings support the use of regular education and training programmes as practical interventions for improving humane slaughter practices within informal poultry slaughter systems.

With regard to factors influencing attitudes towards chicken welfare, formal welfare training, higher education level and previous regulatory inspection independently predicted positive attitudes among slaughter handlers. Respondents who had received formal training were more likely to appreciate the importance of humane slaughter and food safety than those who had never been trained. This finding is expected because structured training provides scientifically accurate information and practical demonstrations that improve both understanding and perception of animal welfare. Similarly, respondents with secondary or tertiary education demonstrated more favourable attitudes than those with lower educational attainment, possibly because education enhances comprehension of scientific information and facilitates acceptance of recommended practices. Comparable findings have been reported in livestock welfare studies where education consistently predicts better knowledge and more positive welfare attitudes (Adesiyan et al., 2025).

Routine inspection of slaughter facilities also emerged as an important determinant of positive attitudes. Handlers operating in premises that had been inspected during the previous year were significantly more likely to demonstrate favourable attitudes towards chicken welfare than those working without regulatory oversight. Regulatory inspections likely reinforce compliance through continuous monitoring, provision of technical guidance and increased awareness of welfare

standards. These findings support recommendations by Ovuru et al. (2024), who emphasized that effective slaughterhouse regulation should combine routine inspection, continuous education and enforcement of hygiene and welfare standards to improve compliance in informal slaughter systems.

The findings of this study have important practical implications for improving chicken welfare within informal slaughterhouses in Uganda. Although the majority of handlers demonstrated adequate knowledge and positive attitudes, notable deficiencies remain regarding humane stunning, bird restraint and hygienic slaughter practices. Strengthening capacity-building programmes focusing on humane handling, welfare legislation, food safety and practical slaughter techniques could substantially improve both animal welfare and meat quality. Furthermore, strengthening routine inspection by veterinary and public health authorities, promoting certification of slaughter handlers and developing context-specific welfare guidelines for informal slaughterhouses may enhance compliance with recommended welfare standards while improving consumer confidence in poultry products.

This study had several strengths. It simultaneously assessed knowledge, attitudes and practices, providing a comprehensive understanding of slaughter handlers' behaviour regarding chicken welfare. The inclusion of direct observational assessment alongside self-reported practices enhanced the validity of the findings by objectively verifying reported practices. Furthermore, the application of multivariable statistical analysis enabled identification of independent predictors of positive attitudes while controlling for potential confounding variables.

Despite these strengths, the study had several limitations. The cross-sectional design limited the ability to establish causal relationships between knowledge, attitudes and practices. The study was conducted within informal slaughterhouses at a single market; therefore, the findings may not be generalisable to formal poultry slaughterhouses or other regions of Uganda. Self-reported responses may also have been affected by recall and social desirability biases despite the inclusion of observational verification. Finally, the study focused primarily on slaughter handlers and did not assess other actors within the poultry value chain whose practices may also influence animal welfare outcomes.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study demonstrated that the majority of slaughter handlers in informal slaughterhouses at Kalerwe Market possessed adequate knowledge, positive attitudes, and moderately good slaughter practices regarding chicken welfare. However, important gaps remained in the adoption of key humane slaughter practices, particularly the use of pre-slaughter stunning, proper bird restraint, and consistent use of personal protective equipment. Knowledge and positive attitudes were significantly associated with better slaughter practices, while formal welfare training, higher educational attainment, and regular regulatory inspection were identified as significant predictors of positive attitudes towards chicken welfare. Overall, the findings indicate that although slaughter handlers have a reasonable understanding of chicken welfare, there is a need for targeted capacity building and strengthened regulatory oversight to improve compliance with recommended humane slaughter practices and enhance both animal welfare and food safety in informal poultry slaughterhouses.

6.2 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

To the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)

- The Ministry should develop and implement standardized national guidelines on humane poultry handling and slaughter that are appropriate for informal slaughterhouses.
- MAAIF should organize regular training and certification programmes for slaughter handlers on chicken welfare, humane slaughter techniques, meat hygiene, and food safety.

To Kampala Capital City Authority (KCCA)

- KCCA should strengthen routine inspection and supervision of informal poultry slaughterhouses to ensure compliance with animal welfare and public health standards.
- The Authority should facilitate the improvement of slaughter infrastructure by providing designated slaughter areas equipped with appropriate waste disposal facilities, clean water, and hygienic working environments.

To Veterinary and Public Health Authorities

- Veterinary officers should conduct continuous sensitization programmes to improve slaughter handlers' knowledge of humane slaughter practices, particularly on the

importance of pre-slaughter stunning, proper restraint, and adequate bleeding before scalding.

- Authorities should encourage the use of appropriate personal protective equipment and promote adherence to food safety regulations through regular monitoring and technical support.

To Slaughter Handlers

- Slaughter handlers should actively participate in training programmes on animal welfare and humane slaughter whenever such opportunities are available.
- They should consistently apply recommended slaughter practices, including gentle handling of birds, use of sharp knives, proper restraint, hygienic slaughter procedures, and safe disposal of slaughter waste to improve both animal welfare and meat quality.

To Poultry Traders' Associations and Market Leaders

- Poultry traders' associations should collaborate with veterinary authorities to promote awareness of chicken welfare standards among slaughter handlers.
- Market leaders should support self-regulation by encouraging compliance with recommended slaughter practices and reporting unhygienic or inhumane slaughter activities.

Recommendations for Future Research

- Similar studies should be conducted in formal poultry slaughterhouses and in other districts of Uganda to determine whether the findings are comparable across different slaughter settings.
- Future research should evaluate the effectiveness of structured welfare training programmes in improving slaughter handlers' knowledge, attitudes, and practices over time using longitudinal or intervention study designs.

REFERENCES

Adesiyan, I. M., Adamu, M. K., Gershon, G. D., Usman, A. B., Fabunmi, T. B., Emmanuel, O. E., & Johnson, O. E. (2025). Assessment of butchers' knowledge of occupational hazards and hygiene practices at slaughterhouses in Bauchi State. *Discover Public Health, 22*(1), 606. https://doi.org/10.1007/s44197-025-00606-x

Aghwan, Z. A. and J. Mac Regenstein (2019). "Slaughter practices of different faiths in different countries." Journal of animal science and technology **61**(3): 111.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alemayehu, G., Berhe, T., Gelan, E., Mokria, M., Jaldessa, J., Molu, J., Wieland, B., Knight-Jones, T. J. D., & Doyle, R. E. (2022). Animal welfare knowledge, attitudes, and practices among livestock holders in Ethiopia. *Frontiers in Veterinary Science, 9*, 1006505. https://doi.org/10.3389/fvets.2022.1006505

Althaus, D., et al. (2017). "Analysis of a poultry slaughter process: Influence of process stages on the microbiological contamination of broiler carcasses." Italian journal of food safety **6**(4): 7097.

Assefa, A., et al. (2023). "Quantitative analysis of knowledge, attitude and practice of workers in chicken slaughter slabs toward food safety and hygiene in Ouagadougou, Burkina Faso." Frontiers in Sustainable Food Systems **6**: 1091209.

Averós, X., et al. (2020). "The value of a retrospective analysis of slaughter records for the welfare of broiler chickens." Poultry Science **99**(11): 5222-5232.

Awuni, E., et al. (2025). "Insights into animal welfare at slaughter: perceptions, knowledge and practices among slaughterhouse workers in Ghana." PAMJ-One Health **16**(4).

Berg, C. and M. Raj (2015). "A review of different stunning methods for poultry—animal welfare aspects (stunning methods for poultry)." Animals **5**(4): 1207-1219.

Carron, M., et al. (2017). "The broiler meat system in Nairobi, Kenya: Using a value chain framework to understand animal and product flows, governance and sanitary risks." Preventive Veterinary Medicine **147**: 90-99.

Clark, B., Stewart, G. B., Panzone, L. A., Kyriazakis, I., & Frewer, L. J. (2016). Citizens, consumers and farm animal welfare: A meta-analysis of willingness-to-pay studies. *Food Policy*, *68*, 112–127. https://doi.org/10.1016/j.foodpol.2017.01.006

Contreras-Jodar, A., et al. (2022). "Inter-observer repeatability of indicators of consciousness after waterbath stunning in broiler chickens." Animals **12**(14): 1800.

Descovich, K., et al. (2019). "The effect of animal welfare training on the knowledge and attitudes of abattoir stakeholders in China." Animals **9**(11): 989.

EFSA AHAW Panel Nielsen, S., et al. (2023). "Welfare of broilers on farm." EFSA J **21**: e07788.

Erian, I., et al. (2019). "Knowledge of stakeholders in the livestock industries of East and Southeast Asia about welfare during transport and slaughter and its relation to their attitudes to improving animal welfare." Animals **9**(3): 99.

Fuseini, A., et al. (2023). "Poultry welfare at slaughter." Poultry **2**(1): 98-110.

Gent, T. C., et al. (2020). "Evaluation of poultry stunning with low atmospheric pressure, carbon dioxide or nitrogen using a single aversion testing paradigm." Animals **10**(8): 1308.

Girasole, M., et al. (2015). "Optimization of stunning electrical parameters to improve animal welfare in a poultry slaughterhouse." Italian journal of food safety **4**(3): 4576.

Govindaiah, P. M., et al. (2023). "Traditional halal meat production without stunning versus commercial slaughter with electrical stunning of slow-growing broiler chicken: Impact on meat quality and proteome changes." Poultry Science **102**(11): 103033.

Lipovšek, M., et al. (2024). "Farm animal welfare during transport and at the slaughterhouse: perceptions of slaughterhouse employees, livestock drivers, and veterinarians." Animals **14**(3): 443.

Mellor, D. J. (2016). "Updating animal welfare thinking: Moving beyond the “Five Freedoms” towards “a Life Worth Living”." Animals **6**(3): 21.

Njoga, E. O., Ilo, S. U., Nwobi, O. C., Onwumere-Idolor, O. S., Ajibo, F. E., Okoli, C. E., Jaja, I. F., & Oguttu, J. W. (2023). Pre-slaughter, slaughter and post-slaughter practices of slaughterhouse workers in Southeast Nigeria: Animal welfare, meat quality, food safety and public health implications. *PLoS ONE, 18*(3), e0282418. https://doi.org/10.1371/journal.pone.0282418

Nyamakwere, F., Muchenje, V., Mushonga, B., Kandiwa, E., Makepe, M., & Mutero, G. (2017). Evaluation of meat safety knowledge, attitudes and practices among slaughterhouse workers of Amathole District in Eastern Cape Province, South Africa. *Journal of Food Safety and Hygiene* .

Ovuru, K. F., et al. (2024). "Slaughterhouse facilities in developing nations: Sanitation and hygiene practices, microbial contaminants and sustainable management system." Food Science and Biotechnology **33**(3): 519-537.

Pirompud, P., et al. (2023). "Preslaughter handling factors affecting dead on arrival, condemnations, and bruising in broiler chickens raised without an antibiotic program." Poultry Science **102**(8): 102828.

Quality, W. (2009). Assessment protocol for poultry, Welfare Quality®.

Reiche, T., et al. (2025). "Antimicrobial resistance reservoirs in salmon and broiler processing environments, sidestreams, and waste discharges." Frontiers in Microbiology **16**: 1662113.

Riggs, M. R., et al. (2023). "Meat quality of broiler chickens processed using electrical and controlled atmosphere stunning systems." Poultry Science **102**(3): 102422.

Saraiva, S., et al. (2020). "Impact of pre-slaughter factors on welfare of broilers." Veterinary and Animal Science **10**: 100146.

Sinclair, M., et al. (2023). "Animal welfare at slaughter: perceptions and knowledge across cultures." Frontiers in Animal Science **4**: 1141789.

Ssemanda, J. N., et al. (2024). "Quantitative assessment of food safety interventions for Campylobacter spp. and Salmonella spp. along the chicken meat supply chain in Burkina Faso and Ethiopia." International Journal of Food Microbiology **415**: 110637.

Skaperda, Z., Veskoukis, A. S., & Kouretas, D. (2019). Farm animal welfare, productivity and meat quality: Interrelation with redox status regulation and antioxidant supplementation as a nutritional intervention. *World Academy of Sciences Journal, 1*(4), 177–183. https://doi.org/10.3892/wasj.2019.18

Vitek, S. and L. Jacobs (2026). "A Decade of Evidence on Broiler Chicken Dead-on-Arrival Rates and Risk Factors: A Scoping Review." Animals **16**(5): 805.

Food and Agriculture Organization of the United Nations. (2023). Africa Sustainable Livestock 2050: Public–private engagement at local level to support One Health policy implementation. Available on https://openknowledge.fao.org/server/api/core/bitstreams/4d617f40-353e-4866-847e-ba74c2c0b5ff/content

Uganda National Bureau of Standards. (2017). Meat hygiene — Code of practice (US CAC/RCP 58:2005). https://webstore.unbs.go.ug/

APPENDICES

Appendix I: Data Collection Tools

The following tools (Tool 1: Informed Consent Form; Tool 2: Structured KAP Questionnaire; Tool 3: Chicken Welfare and Slaughter Observation Checklist) were adapted from structured questionnaires and checklists used in comparable studies by Assata et al. (2023), Aunis et al. (2025), Njoga et al. (2023), and Goić Barišić et al. (2024), and modified to reflect the context of informal chicken slaughterhouses at Kalerwe Market, Kampala.

MAKERERE UNIVERSITY

College of Veterinary Medicine, Animal Resources and Biosecurity (COVAB)

DATA COLLECTION INSTRUMENTS

Knowledge, Attitudes, and Practices of Slaughter Handlers on Chickens' Welfare:

A Case Study of Informal Slaughterhouses at Kalerwe Market

Researcher: ABAHO Rogers (23/U/2042)

Degree: Bachelor of Animal Production Technology and Management

June 2026

General Objective:

To assess slaughter handlers' knowledge, attitudes, and practices on chicken welfare during slaughter in informal slaughterhouses at Kalerwe Market.

Specific Objectives:

To assess the knowledge, attitudes, and practices of slaughter handlers on the welfare of chickens in informal slaughterhouses at Kalerwe.

To determine the relationship between knowledge, attitude, and chicken handlers' slaughter practices in informal slaughterhouses at Kalerwe.

To assess the factors that influence slaughter handlers' attitudes towards the welfare of chickens at slaughter in informal slaughterhouses at Kalerwe.

TOOL ALLOCATION BY OBJECTIVE

Specific Objective 1	**Specific Objective 2**	**Specific Objective 3**
Assess the KAP of slaughter handlers on chicken welfare at Kalerwe. Tool 1: Informed Consent Form Tool 2: KAP Questionnaire (Sections A, B, C, D) Tool 3: Welfare & Hygiene Observation Checklist	*Determine the relationship between knowledge, attitude, and practices of slaughter handlers.* Tool 2: KAP Questionnaire (Sections B, C, D) Tool 3: Observation Checklist (Parts A–C) — objective practice measure *(Knowledge & Attitude scores as independent variables; Practice scores (self-reported + observed) as dependent variable for correlation/regression analysis)*	*Assess factors influencing handlers' attitudes towards chicken welfare.* Tool 2: KAP Questionnaire (Sections A, C) *(Socio-demographics as independent variables; Attitude score as dependent variable for logistic regression)*

TOOL 1: INFORMED CONSENT FORM

Applies to: All three specific objectives (prerequisite for all data collection).

1.1 Study Purpose

You are being invited to participate in a research study titled: "Knowledge, Attitudes, and Practices of Slaughter Handlers on Chickens' Welfare: A Case Study of Informal Slaughterhouses at Kalerwe Market", conducted by ABAHO Rogers, a student at Makerere University (College of Veterinary Medicine, Animal Resources and Biosecurity).

The purpose of this study is to understand how slaughter handlers think about, feel about, and carry out practices related to the welfare of chickens during slaughter, and to identify the factors that shape these attitudes and practices. The results will help improve training and policy for informal slaughterhouses in Uganda.

1.2 What Participation Involves

If you agree to participate, you will be asked to:

Answer questions in a structured interview lasting approximately 30–45 minutes about your background, knowledge of chicken welfare, attitudes, and slaughter practices.

Allow the researcher to directly observe the slaughter process you carry out. Nothing will be interfered with; the researcher will only observe and record.

1.3 Risks and Benefits

Risks:

There are no foreseeable physical risks. Some questions may relate to your daily work practices. You may decline to answer any question you are uncomfortable with.

Benefits:

While there is no direct personal benefit, your participation will contribute to evidence that can improve training and conditions for slaughter handlers and chicken welfare at Kalerwe Market and across Uganda.

1.4 Confidentiality

All information you provide will be kept strictly confidential. Your name will not appear on any questionnaire; a coded identification number will be used instead. Data will be stored securely and accessed only by the researcher and supervisor. Results will be reported in aggregate form and no individual will be identifiable in any publication.

1.5 Voluntary Participation

Your participation is entirely voluntary. You may choose not to participate or to stop at any time without penalty. Your refusal or withdrawal will not affect your work at Kalerwe Market in any way.

1.6 Contact Information

Researcher	Abaho Rogers | Tel: _____ | Email: _____
Supervisor	Name: _____ | Tel: _____ |Signature: _____
Ethics Committee	COVAB Research Ethics Committee, Makerere University, Kampala

1.7 Consent Declaration:

PARTICIPANT:
I have read (or had read to me) the information above. I have had the opportunity to ask questions and have them answered. I understand that my participation is voluntary and that I may withdraw at any time without consequence. I agree to participate in this study.

Participant Name (optional): _____	Participant ID Code: _____
Participant Signature / Thumbprint: _____	Date: _____

RESEARCHER:
I have explained the study to the participant and answered all their questions. I confirm the participant gave consent freely.

Researcher Signature: _____	Date: _____

TOOL 2: STRUCTURED KAP QUESTIONNAIRE
Applies to: Objective 1 (Sections A, B, C, D) \| Objective 2 (Sections B, C, D) \| Objective 3 (Sections A, C).
Instructions to interviewer: Read each question aloud in the respondent's preferred language. Circle or record the appropriate response. Do not lead the respondent. Interview time: approximately 30–40 minutes.

Questionnaire ID:	
Date of Interview:	
Start Time / End Time:	
Interviewer Code:	

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS
Purpose: Describes the study population; serves as the independent variable for Objective 3 (factors influencing attitude) regression analysis. (10 items)

No.	Item	Response
A1	Age (years)	[ ] 18–25 [ ] 26–35 [ ] 36–45 [ ] 46–55 [ ] 56+
A2	Sex	[ ] Male [ ] Female
A3	Highest level of formal education completed	[ ] No formal education [ ] Primary [ ] O-level (S1–S4) [ ] A-level (S5–S6) [ ] Tertiary/University
A4	Religion	[ ] Catholic [ ] Protestant [ ] Muslim [ ] Pentecostal [ ] Other: _____
A5	Years of experience in chicken slaughter	[ ] <1 year [ ] 1–3 years [ ] 4–7 years [ ] 8–15 years [ ] >15 years

No.	Item	Response
A6	How did you learn chicken slaughter skills?	[ ] Self-taught [ ] Learnt from a colleague/family member [ ] Formal training [ ] Other: _____
A7	Have you ever received any formal training on chicken welfare or humane slaughter?	[ ] Yes [ ] No (If Yes, specify source: _____)
A8	Average number of chickens you personally slaughter per day	[ ] 1–10 [ ] 11–30 [ ] 31–60 [ ] 61–100 [ ] >100
A9	Do you hold a valid operating license or permit for your slaughter business?	[ ] Yes [ ] No [ ] Not aware if required
A10	Has your slaughter point been inspected by any authority in the past 12 months?	[ ] Yes, frequently [ ] Yes, once [ ] Never [ ] Not sure

SECTION B: KNOWLEDGE ASSESSMENT

Purpose: Objective 1 (K component of KAP) | Objective 2 (Knowledge score as independent variable correlated with Practices). Score: /18 total (B1: Food Safety & Hygiene = /12; B2: Animal Welfare = /6).

Instructions: Read each statement aloud. Ask the respondent to say whether it is TRUE or FALSE or if they DON'T KNOW. Award 1 mark for each correct answer (correct answers in parentheses). Do not reveal correct answers during interview.

Section B1: Food Safety & Hygiene Knowledge (12 items, Score: ___/12)

No.	Statement	Options	Score
B1.1	Chickens should be rested/water-deprived for a short period before slaughter to reduce gut contents and contamination risk.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.2	A chicken that dies during transport (dead on arrival) is safe to slaughter and sell for human consumption.	[ ] True [ ] False (correct) [ ] Don't know	[ ]
B1.3	Using a blunt or dirty knife during slaughter can increase the risk of contaminating the chicken carcass.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.4	Scalding water used for defeathering should be changed regularly or maintained clean to prevent cross-contamination.	[ ] True (correct) [ ] False [ ] Don't know	[ ]

No.	Statement	Options	Score
B1.5	Slaughter handlers should wash their hands between slaughtering different birds, especially when switching between sick and healthy birds.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.6	Placing a slaughtered chicken carcass directly on the bare ground before washing increases contamination risk.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.7	Salmonella and Campylobacter bacteria can be present in chickens without the bird appearing sick.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.8	Chicken meat that looks and smells normal is always safe to eat (cannot carry harmful bacteria).	[ ] True [ ] False (correct) [ ] Don't know	[ ]
B1.9	Slaughter equipment (knives, boards) should be cleaned and disinfected at least once per working day.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.10	Wearing protective clothing (apron, gloves) while slaughtering chickens reduces risk of transferring bacteria to the meat.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.11	A chicken carcass should be fully bled before being placed in scalding water.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B1.12	Slaughtering sick or visibly injured birds for sale poses no additional food safety risk.	[ ] True [ ] False (correct) [ ] Don't know	[ ]

Section B2: Animal Welfare Knowledge (6 items, Score: ___/6)

No.	Statement	Options	Score
B2.1	A sharp knife causes less pain to a chicken during slaughter than a blunt one.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B2.2	Chickens feel pain and distress during slaughter if not properly handled.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B2.3	Hanging a chicken upside down by one leg for a long period before slaughter is a humane practice.	[ ] True [ ] False (correct)	[ ]

No.	Statement	Options	Score
		[ ] Don't know	
B2.4	Stunning a chicken before killing (making it unconscious) is considered more humane than slaughter without stunning.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B2.5	Rough handling, throwing, or carrying birds by the wings causes pain and injury.	[ ] True (correct) [ ] False [ ] Don't know	[ ]
B2.6	A minimum bleeding time should be allowed after the neck cut before the bird is placed in scalding water.	[ ] True (correct) [ ] False [ ] Don't know	[ ]

KNOWLEDGE SCORING SUMMARY

B1 Food Safety & Hygiene Score:	___ / 12	**B2 Animal Welfare Score:**	___ / 6
Total Knowledge Score:	___ / 18	**Grade:**	[ ] Adequate (≥10/18) [ ] Inadequate (<10/18)

SECTION C: ATTITUDE ASSESSMENT

Purpose: Objective 1 (A component of KAP) | Objective 2 (Attitude score as independent variable correlated with Practices) | Objective 3 (Attitude score as the DEPENDENT variable for factors analysis).

*Instructions: Read each statement and ask the respondent how much they agree. SA=Strongly Agree (5), A=Agree (4), U=Undecided (3), D=Disagree (2), SD=Strongly Disagree (1). Items marked * are negatively worded and must be REVERSE-SCORED before analysis (reverse: SA=1, A=2, U=3, D=4, SD=5).*

Section C1: Food Safety Attitudes (7 items, Score: ___/35)

No.	Statement	SA (5)	A (4)	U (3)	D (2)	SD (1)
C1.1	It is important to maintain a clean work area during chicken slaughter to protect consumers' health.	[ ]	[ ]	[ ]	[ ]	[ ]
C1.2	Washing hands between handling different chickens is a necessary step in my work.	[ ]	[ ]	[ ]	[ ]	[ ]
C1.3	Using a clean, sharp knife is essential for safe chicken slaughter.	[ ]	[ ]	[ ]	[ ]	[ ]
C1.4*	(*REVERSE SCORE) Food contamination during slaughter is not my responsibility as a handler; it is the consumer's problem.	[ ]	[ ]	[ ]	[ ]	[ ]

No.	Statement	SA (5)	A (4)	U (3)	D (2)	SD (1)
C1.5	Proper waste disposal at my slaughter point is important for preventing disease in my work environment.	[ ]	[ ]	[ ]	[ ]	[ ]
C1.6	I believe I have a personal responsibility to ensure the chicken I slaughter is safe for consumers.	[ ]	[ ]	[ ]	[ ]	[ ]
C1.7	Regular inspection of slaughter facilities by authorities is beneficial for improving hygiene standards.	[ ]	[ ]	[ ]	[ ]	[ ]

Section C2: Animal Welfare Attitudes (6 items, Score: ___/30)

No.	Statement	SA (5)	A (4)	U (3)	D (2)	SD (1)
C2.1	It is important to minimize pain and distress in chickens during slaughter.	[ ]	[ ]	[ ]	[ ]	[ ]
C2.2	Chickens that are handled gently before slaughter are easier to work with and produce better quality meat.	[ ]	[ ]	[ ]	[ ]	[ ]
C2.3	I would be willing to change my slaughter practices if shown a method that reduces suffering in birds.	[ ]	[ ]	[ ]	[ ]	[ ]
C2.4	Allowing sufficient time for a chicken to fully bleed before scalding is an important step I should always follow.	[ ]	[ ]	[ ]	[ ]	[ ]
C2.5*	(*REVERSE SCORE) The way a chicken is handled before and during slaughter does not affect the quality of the meat.	[ ]	[ ]	[ ]	[ ]	[ ]
C2.6*	(*REVERSE SCORE) Whether a chicken suffers during slaughter does not matter as long as the meat is sold quickly.	[ ]	[ ]	[ ]	[ ]	[ ]

ATTITUDE SCORING SUMMARY

C1 Food Safety Attitude Score:	___ / 35	**C2 Animal Welfare Attitude Score:**	___ / 30
Total Attitude Score:	___ / 65	**Grade:**	[ ] Positive (≥39/65) [ ] Negative (<39/65)

SECTION D: SELF-REPORTED SLAUGHTER PRACTICES

Purpose: Objective 1 (P component of KAP) | Objective 2 (Practice score as the DEPENDENT variable correlated/regressed against Knowledge and Attitude scores). 12 items, Score: ___/12. Instructions: Ask the respondent about what they ACTUALLY DO during their slaughter work. These are self-reported practices; independent verification is performed through the observation checklist (Tool 3). The best-practice response (scoring 1 point) is marked [+]. All other responses score 0.

No.	Practice Item	Response Options (+ = best practice, 1 pt)
D1	How do you typically restrain/hold a live chicken immediately before slaughter?	[+] Hold both legs gently [ ] Hold by one leg (inverted) [ ] Hold by the wings [+] Place in restraint cone/tube [ ] Other: _____
D2	How many cuts do you typically make to slaughter a chicken?	[+] One swift deep cut [ ] Two cuts [ ] Multiple cuts [ ] I saw through the neck
D3	Do you use pre-slaughter stunning before killing chickens?	[+] Yes, always [ ] Yes, sometimes [ ] Rarely [ ] Never
D4	After the neck cut, how long do you wait before placing the bird in scalding water?	[ ] <30 seconds [ ] 30 seconds – 1 minute [+] 1–2 minutes [+] 2+ minutes [ ] Until bird stops moving (not timed)
D5	Do you check that the bird is dead (no breathing, no eye reflexes) before placing it in scalding water?	[+] Yes, always [ ] Yes, sometimes [ ] Rarely [ ] Never
D6	How often do you sharpen or replace your slaughter knife?	[+] Daily [ ] Every few days [ ] Weekly [ ] Monthly or less [ ] Only when noticeably blunt
D7	How do you carry live chickens from the holding area to the slaughter point?	[+] By both legs together gently [ ] By one leg (inverted) [+] In a crate/container [ ] Held against the body [ ] Other: _____

No.	Practice Item	Response Options (+ = best practice, 1 pt)
D8	How do you typically dispose of feathers, blood, and offal from your slaughter operations?	[+] Collect and dispose in designated waste area [ ] Throw into open drainage channel [ ] Leave on ground/sweep later [ ] Sell to others [ ] Other: _____
D9	Do you wash and disinfect your knife and work surface between slaughtering sessions or batches?	[+] Yes, between each bird [+] Yes, after every batch [ ] Yes, at end of day only [ ] Rarely [ ] Never
D10	What protective clothing do you use during slaughter?	[+] Apron + gloves + boots [ ] Apron only [ ] Gloves only [ ] No protective clothing [ ] Other: _____
D11	Do you rest/withhold feed from chickens for a short period before slaughter?	[+] Yes, always [ ] Yes, sometimes [ ] Rarely [ ] Never
D12	Do you separate visibly sick or injured birds from healthy birds before slaughter?	[+] Yes, always [ ] Yes, sometimes [ ] Rarely [ ] Never [ ] I slaughter them first to avoid loss

PRACTICE SCORING SUMMARY

Self-Reported Practice Score:	___ / 12	**Grade:**	[ ] Good (≥8/12) [ ] Fair (5–7) [ ] Poor (<5)

Note: This Practice score is the DEPENDENT VARIABLE for Objective 2 analysis (relationship with Knowledge and Attitude scores).