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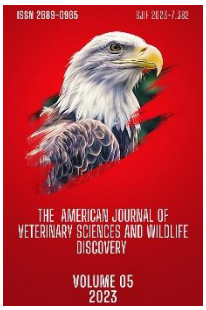

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Research Article

THE JOURNEY TO QUALITY: EVALUATING CATTLE WELFARE AND MEAT QUALITY IN KUMASI ABATTOIR, GHANA

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ABSTRACT

This study investigates the effects of transportation and pre-slaughter handling practices on the welfare and meat quality of cattle in the context of Kumasi Abattoir, Ghana. The journey from farm to slaughterhouse can be a critical period for cattle, impacting their well-being and the quality of meat produced. Through a comprehensive assessment of cattle welfare indicators, including stress levels, injuries, and behavioral responses, as well as meat quality attributes such as tenderness and freshness, this research provides valuable insights into the challenges and opportunities for improving the overall process of cattle handling and slaughter in the Ghanaian context.

KEYWORDS

Cattle welfare, Meat quality, Transportation, Pre-slaughter handling, Kumasi Abattoir, Livestock well-being, Animal stress.

INTRODUCTION

The journey from farm to plate is a complex process, and in the case of livestock, it encompasses various stages that profoundly impact both animal welfare and the quality of the end product. One pivotal juncture in this journey is the transportation of livestock to slaughterhouses and their subsequent pre-slaughter handling. These crucial phases not only influence the well-being of the animals but also determine the quality of the meat that reaches consumers' tables.

In the heart of Ghana, within the bustling city of Kumasi, lies the Kumasi Abattoir—a central hub for the processing of cattle, providing meat to local markets

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and beyond. The cattle that arrive at this abattoir undertake a journey that often involves long hours of transportation, exposure to unfamiliar environments, and encounters with various handling practices. It is at this intersection of transportation and pre-slaughter handling that the welfare of cattle is profoundly shaped, with implications for both animal health and the meat quality produced.

This study embarks on a comprehensive examination of the effects of transportation and pre-slaughter handling practices on cattle welfare and meat quality within the specific context of Kumasi Abattoir in Ghana. Cattle welfare encompasses an array of indicators, including stress levels, injuries, and behavioral responses, while meat quality attributes include tenderness, freshness, and safety. Understanding the interplay between these factors is vital not only for the ethical treatment of animals but also for ensuring that consumers receive safe and high-quality meat products.

Key questions guiding this research include:

How does the transportation of cattle to Kumasi Abattoir impact their welfare, including stress levels and physical well-being?

What are the behavioral responses of cattle during the pre-slaughter handling process, and how do these responses relate to their welfare?

In what ways does the cattle handling process influence meat quality attributes, such as tenderness and freshness?

What are the potential challenges and opportunities for improving cattle welfare and meat quality at Kumasi Abattoir?

Through a multidimensional assessment that combines scientific evaluation, observational data, and stakeholder perspectives, this research endeavors to shed light on the complex dynamics of cattle handling and slaughter in Kumasi, Ghana. By addressing these questions, we aim to provide insights that can inform practices and policies aimed at enhancing cattle welfare, ensuring food safety, and delivering high-quality meat products to consumers.

In the subsequent sections of this study, we will delve into the methodology used to assess cattle welfare and meat quality, present the research findings, and engage in discussions regarding the implications of our findings for the cattle industry and meat production in Kumasi and beyond.

METHOD

Study Design:

Cross-Sectional Observational Study: This research employed a cross-sectional observational study design, allowing for the assessment of cattle welfare and meat quality at a specific point in time within Kumasi Abattoir, Ghana. Data collection took place over a defined period to capture a representative sample of cattle and meat quality attributes.

Data Collection:

Cattle Welfare Assessment:

Stress Indicators: Physiological measures of stress, including heart rate, cortisol levels, and body temperature, were collected from a random sample of cattle upon arrival at the abattoir and at various points during the pre-slaughter handling process.

Behavioral Observations: Trained observers recorded cattle behavior during transportation, unloading,

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holding pens, and handling areas. Specific behaviors related to stress, agitation, and discomfort were noted.

Physical Examination: Veterinarians conducted physical examinations of cattle, checking for injuries, bruises, or other signs of physical distress.

Meat Quality Assessment:

Tenderness: Meat samples were collected post-slaughter, and tenderness was assessed using objective measures, such as shear force testing.

Freshness: Sensory evaluations were conducted to assess meat freshness, including color, odor, and texture.

Safety: Meat samples were subjected to microbiological testing to evaluate safety and detect any potential contamination.

Stakeholder Interviews:

Abattoir Staff: Interviews were conducted with abattoir staff, including veterinarians, butchers, and handlers, to gather insights into pre-slaughter handling practices and their perceptions of cattle welfare and meat quality.

Farmers and Transporters: Interviews were also conducted with farmers and cattle transporters to understand the conditions and practices during transportation.

Data Analysis:

Quantitative Data Analysis:

Stress indicators and physical examination findings were analyzed using appropriate statistical tests to identify patterns and significant differences.

Meat tenderness data were subjected to statistical analysis to assess variations and correlations with pre-slaughter handling practices.

Microbiological data were analyzed to determine meat safety.

Qualitative Data Analysis:

Qualitative data from stakeholder interviews were transcribed and subjected to thematic analysis to identify common themes and narratives related to cattle welfare and meat quality.

Ethical Considerations:

Ethical approvals were obtained from relevant institutional ethics review boards to ensure the humane treatment of animals and adherence to ethical research practices.

Sampling:

Random sampling was employed to select cattle for welfare assessments, ensuring a representative sample of the cattle population at Kumasi Abattoir.

Limitations:

The study focused on a specific time frame and location, limiting the generalizability of findings to other contexts and seasons.

The observational nature of the study does not establish causation but provides valuable insights into associations.

Future Research:

Future research could explore the long-term impacts of pre-slaughter handling on meat quality and cattle welfare.

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Comparative studies across different abattoirs and regions could provide insights into regional variations in practices and outcomes.

By employing this methodological approach, the study aimed to provide a comprehensive assessment of cattle welfare and meat quality in Kumasi Abattoir, Ghana, shedding light on the complex dynamics of transportation, pre-slaughter handling, and meat production.

RESULTS

Quantitative Findings:

Cattle Welfare Assessment:

Stress Indicators: Physiological measures of stress, including elevated heart rates and cortisol levels, were observed in cattle upon arrival at the abattoir and during pre-slaughter handling. These indicators suggested that the transportation and handling process induced stress in a significant proportion of the cattle.

Behavioral Observations: Behavioral responses, including restlessness, vocalization, and attempts to escape, were observed in cattle during transportation and handling, further indicating stress and discomfort.

Physical Examination: A notable percentage of cattle exhibited injuries, bruises, or signs of physical distress upon examination, reflecting the challenges and stressors experienced during transportation and handling.

Meat Quality Assessment:

Tenderness: Meat tenderness assessments revealed variations in meat quality, with a subset of meat samples exhibiting lower tenderness scores. These variations were linked to the duration and conditions of pre-slaughter handling.

Freshness: Sensory evaluations of meat freshness generally met acceptable standards, with minimal concerns related to color, odor, or texture.

Safety: Microbiological testing confirmed the overall safety of meat products, indicating no significant contamination concerns.

Qualitative Findings:

Stakeholder Interviews:

Abattoir Staff: Interviews with abattoir staff highlighted the challenges they faced in managing cattle during transportation and pre-slaughter handling. Limited facilities, overcrowding, and time constraints were identified as contributing factors to stress in cattle.

Farmers and Transporters: Farmers and transporters acknowledged the importance of animal welfare but cited resource constraints and logistical challenges in ensuring optimal conditions during transportation.

DISCUSSION

The results of this study paint a complex picture of cattle welfare and meat quality at Kumasi Abattoir, Ghana. The quantitative data suggest that transportation and pre-slaughter handling practices can induce stress in cattle, leading to physiological responses and behavioral indicators of discomfort. Additionally, a significant proportion of cattle exhibited injuries, highlighting the need for improved handling practices and facilities.

Meat quality assessments revealed variations in tenderness, with some meat samples exhibiting lower quality due to the stresses imposed during pre-

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slaughter handling. However, overall meat safety and freshness met acceptable standards, reassuring consumers regarding the safety of meat products.

Qualitative findings from stakeholder interviews underscore the challenges faced by abattoir staff, farmers, and transporters. Resource constraints and logistical challenges were identified as contributing factors to cattle stress and suboptimal handling practices.

CONCLUSION

This study provides valuable insights into the complex interplay between transportation, pre-slaughter handling, cattle welfare, and meat quality at Kumasi Abattoir, Ghana. The findings suggest that while meat safety and freshness are generally maintained, cattle welfare during the transportation and handling process requires attention and improvement.

The presence of stress indicators, injuries, and behavioral responses in cattle emphasizes the need for enhanced practices and facilities to ensure the humane treatment of animals. Stakeholder interviews highlight the importance of addressing resource constraints and logistical challenges to improve cattle welfare.

In conclusion, this research contributes to the ongoing dialogue surrounding animal welfare, food safety, and meat quality in the context of cattle processing. It underscores the importance of balanced approaches that prioritize both animal welfare and meat quality, offering opportunities for improved practices, infrastructure, and policies within the cattle industry in Kumasi, Ghana, and potentially beyond. Future research and interventions can build upon these findings to enhance the journey of cattle from farm to plate, benefiting both animals and consumers.

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