



APPRAISAL OF ANTE-MORTEM INSPECTION AND POST-MORTEM INSPECTION OF MEAT IN ABATTOIRS OF GOMBE STATE, NIGERIA

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Abstract

The purpose of this study was to determine the ante mortem and post mortem inspections of meat in abattoirs of Gombe State, Nigeria. The study was guided by six objectives, six research questions, and six null hypotheses. The study was anchored on the Theory of Reasoned Action (TRA) propounded by Fishbein and Ajzen (1967), which explains on the basis of ante mortem and post mortem inspections of meat in abattoirs. Literature on ante mortem and post mortem inspections were reviewed. Survey research design was used for the study. The population of the study were veterinary doctors and butchers in Gombe state abattoirs from the three senatorial districts. Sample of 579 was randomly selected using a stratified random sampling technique. The instrument used for data collection was a self-developed 30-item questionnaire. Analysis of data were done using descriptive statistics (frequency counts and percentages) and inferential statistics of Analysis of Variance (ANOVA) at 0.05 level of significance and computed with SPSS version 27 to answer research questions and hypotheses. Results shows that, the ante-mortem inspection were of significant disparities in ante-mortem inspection ($F = 14.08, p < 0.05$), where Gombe North again showed the lowest performance, and post-mortem inspection ($F = 5.398, p < 0.05$), with Gombe South outperforming other districts.

Keywords: *Ante-mortem Inspection, Post-mortem Inspection, Abattoirs*

Introduction

Ante-mortem inspection (AMI) serves as the first critical control point in ensuring meat safety and animal welfare at abattoirs. One of the requirements in meat hygiene is inspection whereby, Paula, (2008) stated that live and slaughtered animals should be inspected before and after slaughter, the inspections to be carried out before slaughter and after slaughter are: ante-mortem and post-mortem. Ante-mortem: the animals should be observed and inspected for any abnormalities in their appearance or behaviour (bruises/deep cut, colour on the hide/skin, wounds, fracture, noddles, and other skin diseases, fumes in the mouth for Tuberculosis suspect, anus with watery byproduct for diarrhoea, cut on the hog, pains, etc, to ascertained the soundness of the animals. The post-mortem inspection is the slaughtered animal meat in which the organs are inspected

Weobong, (2001) noted that most butchers use unsafe water to wash meat, resulting in contaminating meat, which are certainly giving room to disease(s). Muwonge, (2012) emphasised that meat must be hygienic and carefully handled both in abattoirs and slaughterhouses, markets or selling points before selling it to customers in order to prevent the transmission of these diseases (Bovine Tuberculosis, Plague, Rabies, Salmonellosis, Influenza, Brucellosis, Anthrax and Bird Flu) to human beings as a result of unhygienic practise. According to Farmers Bulletin No. 2264, 1977, said that any situation of an unsound meat must be taken with seriousness like an abnormality or enlargement of lung, kidney intestine, chest, cavity or any other part of slaughtered animal. It has been considered by the bulletin that bruises, minor injuries, worms (parasites) in the organs, tumors are conditions that can be simply cutoff/removed, and leave the remaining part in



which can be used as food. Main aim of post-mortem inspection is to add value to ante-mortem inspection and to detect: disease(s) of public health importance. There have also been occurrences of helminthic and brucellosis infections in cattle, goats, sheep, rams etc across Nigeria, (Allwin, 2015).

Methodology

The research design used for this study was descriptive survey research design. According to Alamu and Olukosi, (2008), survey research design deals with the collection of data for the purpose of describing and interpreting existing conditions, prevailing practice, beliefs, attitudes and ongoing processes. The survey research design was appropriate in determining the appraisal of meat hygiene practice in abattoirs among butchers of Gombe State, Nigeria. The population for this study was two thousand nine hundred and sixty-one (2961) butchers of Gombe State, Nigeria. Stratified random sampling was used to select six abattoirs from the three (3) senatorial districts of Gombe State, thus Gombe Central, Dadin-Kowa and Kumo, Gombe North, Gombe town and Malan-Sidi and Gombe South, Kaltungo and Billiri. Simple random sampling technique was used using Letter S (meaning sample) was written on piece of papers and the piece of the papers were squeezed and then asked them to pick with replacement, any letter S that was picked stands as sample until the required numbers were obtained thus, five hundred and seventy-nine (579) respondents, it was done senatorial district by senatorial district of Gombe State. a self-developed questionnaire of 30 items.

Results

Table 4.1: Demographic Characteristics of the Respondents (n=579)

S/N	Items	Responses	Frequency	Percentages (%)
1	District	Gombe Central	163	28.2
		Gombe North	255	44.0
		Gombe South	161	27.8
2	Age of Respondents	25 years and below	55	9.5
		26 – 30 years	164	28.3
		31 – 35 years	170	29.4
		36 – 40 years	136	23.5
		Above 40 years	54	9.3
3	Years of Experience	1 – 10 years	170	29.4
		11 – 20 years	219	37.8
		21 – 30 years	154	26.6
		31 years and above	36	6.2
4	Educational Level	FSLC	142	24.5
		WAEC/NECO/NABTEB	181	31.3
		OND/NCE	153	26.4
		Degree/HND	87	15.0
		Others	16	2.8
5	Marital Status	Single	92	15.9



Married	331	57.2
Widower	84	14.5
Separated	72	12.4

H01: There is no significant difference in ante-mortem inspection of animals among Senatorial Districts in abattoirs, Gombe State.

Table 4.1: ANOVA Results for Ante Mortem Inspection of Animals in Abattoirs, Gombe State

Source of Variation	Sum of squares	Df	Mean squares	F-value	P-value	Remark
Between Groups	127.74	2	63.87	14.08	0.001	Rejected
Within Groups	2612.51	576	4.54			
Total	2740.25	578				

The table 4.1 presents the results of ANOVA test on ante-mortem inspection of animals across abattoirs in the three senatorial districts of Gombe State, Nigeria. The analysis shows a statistically significant difference among the abattoirs, with an F-value of 14.08 and a p-value of 0.001. This leads to the rejection of the null hypothesis (H_01), which posited that there is no significant difference in ante-mortem inspection of animals among Senatorial Districts in Gombe State.

H02: There is no significant difference in post-mortem inspection of meat in abattoirs among Senatorial Districts in Gombe State, Nigeria.

Table 4.2: ANOVA Results for Post Mortem Inspection of Meat in Abattoirs

Source of Variation	Sum of Squares	df	Mean Squares	F	p-value	Remark
Between Groups	47.07	2	23.54	5.398	0.005	Rejected
Within Groups	2511.35	576	4.36			
Total	2558.42	578				

The table 4.2 presents the results of ANOVA test conducted to determine whether there is significant difference in post-mortem inspection of meat across abattoirs in the senatorial districts of Gombe State, Nigeria. The analysis yielded an F-value of 5.398 with a p-value of 0.005, indicating a statistically significant difference among the abattoirs. The null hypothesis (H_02), which posited that there is no significant difference in meat inspection among Senatorial Districts in abattoirs, is rejected.

Discussion

The study determined the practice of meat hygiene among butchers in abattoirs in Gombe State, Nigeria, focusing on two key variables: the ante-mortem inspection of animals and post-mortem inspection of meat in abattoirs. The study on the ante-mortem inspection of animals in abattoirs in Gombe State revealed a statistically significant difference across the three senatorial districts, indicating that Gombe North performed significantly lower in ante-mortem inspection compared to Gombe Central and Gombe South. This result highlights uneven enforcement of veterinary



oversight and inspection standards within the state, showing that some districts maintain effective pre-slaughter examination systems while others lack consistent regulatory monitoring. Ante-mortem inspection is a critical stage in meat hygiene because it ensures that only healthy animals enter the slaughter process (abattoirs), thereby safeguarding public health and preventing zoonotic disease(s) transmission. The lower performance in Gombe North suggests weaknesses in veterinary supervision, inadequate training of butchers, and insufficient institutional capacity to enforce compliance with inspection protocols.

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This finding corresponds with the study which observed that 12% of animals brought for slaughter showed signs of disease or fatigue, primarily due to poor pre-slaughter handling (Ante-mortem inspection) and limited regulatory oversight. Similarly, 8.5% of animals exhibited zoonotic conditions detectable during ante-mortem inspection, reinforcing the need for skilled inspectors and consistent veterinary presence. Both studies support the present finding by showing that where regulatory systems are weak, animal health assessment before slaughter is poorly executed, thereby increasing the risk of contamination. These studies further illustrate that effective ante-mortem inspection requires institutional commitment, professional training, and structured supervision—factors that appear lacking in Gombe North.

Conversely, the present study's result differs from findings who demonstrated that systematic monitoring and proper management frameworks improve inspection efficiency and economic performance. Patel and Deshmukh (2022), found that routine monitoring of environmental conditions, such as heat stress, significantly reduced inspection failures, while Oliveira (2023). emphasized the economic benefits of maintaining rigorous ante-mortem standards, as they prevent substantial financial losses caused by condemned carcasses. Similarly, that regular veterinary supervision and feedback sessions improved ante-mortem inspection outcomes and reduced disease(s) rates. These studies suggest that consistent inspection mechanisms and regulatory enforcement are the strongest determinants of successful ante-mortem inspections, implying that the gap observed in Gombe North can be bridged through systematic monitoring.

Additional support comes in Uganda, who revealed that the type of production system significantly influenced inspection outcomes. They found that pastoral cattle, which are often exposed to harsher conditions and limited veterinary care, showed higher rejection rates than dairy cattle from managed systems. This aligns with the situation in Gombe North, where extensive livestock rearing and limited veterinary infrastructure may hinder thorough inspection. Similarly, Van der Merwe and Botha (2022), identified inadequate training and the absence of guidelines as major barriers to effective inspection in South African abattoirs, echoing the need for capacity building in inspection personnel. Together, these studies indicated that effective ante-mortem



inspection depends not only on infrastructure but also on training, supervision, and awareness among butchers and inspectors.

Connecting the findings to the Theory of Reasoned Action (TRA) provides behavioural insight into the variation observed across Gombe State. The theory suggests that behaviour is shaped by individuals' attitudes and perceived social norms. In the context of ante-mortem inspection, inspectors and butchers who hold positive attitudes toward animal health and hygiene, and who work in environments with strong regulatory expectations, are more likely to perform effective inspections. The stronger performance of Gombe Central and South supports this view, as higher compliance reflects the influence of favourable attitudes and institutional norms promoting hygienic behaviour. Conversely, the weak inspection culture in Gombe North reflects low normative pressure and poor behavioural motivation, as individuals may not perceive hygiene as a valued or enforced practice. While the TRA explains these behavioural tendencies, the current study extends its implications by demonstrating that positive attitudes and norms alone are insufficient without adequate infrastructure, enforcement, and veterinary capacity. Therefore, improving ante-mortem inspection practices in Gombe State requires not only behavioural change and awareness campaigns but also investment in institutional support and resources to ensure that hygienic practices are both socially reinforced and practically achievable.

The study on the post-mortem inspection of meat in abattoirs in Gombe State revealed a statistically significant difference across the three senatorial districts, with Gombe South demonstrating better inspection practices than Gombe Central and Gombe North. However, the difference between Gombe South and the other two districts was not statistically significant. This result suggests that while post-mortem inspection practices in Gombe South are relatively more efficient, the overall inspection standards across the state remain inconsistent. The improved performance in Gombe South may be attributed to better-trained veterinary inspectors, more consistent monitoring systems, or stronger institutional commitment to hygiene standards. Meanwhile, the marginal difference between the other district's points to systemic challenges such as inadequate staffing, outdated inspection protocols, and poor reporting structures. Effective post-mortem inspection is crucial for ensuring that only safe, wholesome meat reaches consumers; therefore, these disparities highlight gaps in policy enforcement and technological adoption that limit inspection accuracy and consistency across Gombe State's abattoirs.

The findings of this study are found in Enugu State, Nigeria, that 7.5% of carcasses and 15.2% of offal were condemned due to parasitic and infectious diseases such as fascioliasis and tuberculosis-like lesions. Their results emphasize the significance of rigorous inspection practices to prevent public health risks and minimize economic losses. Similarly, in Mexico observed that inadequate inspection protocols for detecting bovine tuberculosis led to substantial economic losses exceeding \$3.5 million USD annually. They recommended targeted inspection systems and better disease control measures at the farm level, reinforcing the idea that thorough post-mortem inspection is indispensable to both economic efficiency and food safety. Furthermore, in South Africa established that post-mortem condemnation patterns vary seasonally with the prevalence of mycotoxins, emphasizing the need for dynamic, risk-based inspection protocols. These studies collectively aligned with the finding that stronger inspection systems, as observed in Gombe South, lead to improved detection of pathological conditions and greater overall meat safety. However, they also suggest that consistency in post-mortem inspection across all districts is necessary to minimize health hazards and economic losses.

Consequently, some international studies highlight advanced inspection technologies that exceed



the manual practices likely used in Gombe State. Implementing digital pathology systems in swine abattoirs enhanced lesion detection accuracy and reduced inspection time by 40%, proving that technology driven inspections outperform traditional methods. Similarly, block chain enabled traceability systems improved post-mortem data management accuracy by 99.8% and reduced inspection decision times by nearly half, ensuring transparency and traceability from abattoir to distribution. These findings challenge the current results by indicating that while Gombe South's better inspection practices are commendable, reliance on conventional inspection methods without technological integration limits effectiveness. Linking the present findings to the Theory of Reasoned Action (TRA) provides a behavioural interpretation: inspectors and abattoir workers in Gombe South may hold more positive attitudes toward hygiene and compliance, reinforced by stronger, social and institutional norms that value public health safety. Conversely, in districts where such attitudes and social pressures are weaker, inspection thoroughness declines. Although the TRA effectively explains the behavioural component of inspection practices, the Gombe results reveal that technology adoption, institutional support, and consistent policy enforcement must accompany positive behavioural intentions to achieve uniform and efficient post-mortem inspection across all abattoirs in the state.

Conclusion

Based on the findings, it was concluded that meat hygiene practices in Gombe State's abattoirs were of low practice and vary significantly across the three (3) senatorial districts. The most notable disparities were in ante-mortem inspection and post-mortem inspection of meat. Gombe North consistently underperformed across these domains, raising significant public health concerns.

Recommendations

Based on the findings of this study, the following recommendations were made: Veterinary units at state and local government levels should ensure consistent and compulsory ante-mortem if not no animal can be slaughtered. While post-mortem inspections must be carried out by qualified veterinary officers to all operational abattoirs in the state. A statewide regulatory framework should be established to monitor hygiene compliance. This may include issuing operational license based on periodic inspections and compliance scores, especially targeting underperforming districts like Gombe North. Public health campaigns should be initiated by health educators and other statutory agencies to increase awareness among butchers (meat vendors) and the butchers are to partake in the campaign. So that they can be updated about the implications of poor hygiene on human health, including the spread of zoonotic diseases in collaboration with Ministry of Health.

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