

Awareness and Attitudes of People Towards Slaughtering of Sick Animals of Unknown History and Meat Hygiene in Makurdi Metropolis Abattoirs

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ABSTRACT

Objectives: To assess consumers knowledge, attitudes and practices associated with risks of consuming sick, dead or unknown health history animals' meat.

Material and Methods: The study adopts a non-experimental quantitative research design. Four hundred meat buyers were randomly sampled, and a structured questionnaire served as the data collection tool. A total of 376 respondents were interviewed using a questionnaire, selected through a simple random sampling technique. Descriptive statistical techniques were employed to analyze the data, and ANOVA was used to test formulated hypotheses at a significance level of 0.05. The data was analyzed using SPSS version 21.

Results: The results from a survey of 400 questionnaires revealed a 94% response rate, with 376 questionnaires returned. The respondents were predominantly female (57%) and aged 30–39 years (52%). Most were married (60%). All respondents were aware of meat hygiene, and 94% were familiar with zoonosis. Opinions on the risks associated with consuming sick or unidentified animals varied: 55% believed that diseases could not be contracted from eating such animals, while 49% felt it was acceptable to consume animals with an unknown health history. A significant majority (85%) recognized that insects could contaminate raw meat, and all respondents (100%) acknowledged that improper meat handling poses health risks to consumers. In terms of knowledge, 37% of respondents demonstrated an adequate understanding of meat hygiene risks, while 63% had inadequate knowledge. Regarding meat processing practices, 34% consumed food or drink while processing meat, and 40% used gloves. While all respondents washed their hands before and after handling meat, only 44% wore protective gear. Most (97%) properly cleaned meat storage areas, though only 47% sterilized utensils, and 30% handled meat despite injuries. Overall, 56% of respondents demonstrated good meat processing practices, indicating a positive trend in hygiene awareness. However, the overall findings across knowledge (37%), attitudes (52%), and practices (56%) highlight significant gaps in the understanding of meat hygiene among consumers and meat processing workers in Makurdi metropolis.

Conclusion: This study underscores a profound lack of awareness and inadequate attitudes among consumers regarding the risks of consuming sick animals and meat hygiene. Given these findings, it is crucial for public health stakeholders to implement educational programs addressing meat hygiene and best practices

Keywords: Awareness, Attitudes, Meat Hygiene, Slaughtering of sick animals, Makurdi metropolis,

INTRODUCTION

In recent years, the food industry has faced significant challenges, particularly within the context of heightened food insecurity [1]. The rise of food insecurity has amplified the consumption of compromised meat as an integral part of daily nutrition, yet the implications of meat quality remain underappreciated [2]. Public health experts assert that "food hygiene is paramount to safeguarding health" as improper handling leads to

widespread illness [1-3] Zoonotic diseases, such as brucellosis and tuberculosis, are prevalent in Nigeria, rife from inadequate meat hygiene, posing a significant public health risk [4-9]. Foodborne and related diseases refer to any illness that arises after consuming food contaminated with pathogens, parasites or viruses [7-9]. Foodborne illnesses and diseases arising from consumption of food affected by chemical substances, toxins and pathogens affects people on a global scale for a number of reasons [22-28]. The leading and key cause of morbidity around the world is diarrheal diseases and this is particularly evident in developing countries. According to the World Health Organization (WHO), diarrheal diseases caused 2.2 deaths among people of all ages and 1.8 million in low-income countries. Of all these reported deaths, 1.5 million were children aged 14 months and below [7-9]. As a global issue, unsafe meat poses the greatest threat to everyone, including young children, pregnant women and the elderly. The major source of foodborne diseases and illnesses is contaminated meat consumption [44]. Foodborne disease commonly occurs in developing countries due to inadequate hygiene and safety practices, inadequate food hygiene laws, poor regulatory mechanisms, poor investment in safety equipment, and a lack of education of meat handlers. Improper meat handling and unhygienic practices during cutting and processing lead to cross-contamination of meat and can cause meat-borne bacterial outbreaks [6-9]. Food-producing animals (e.g., cattle, chickens, pigs, and turkeys) are the major reservoirs for many foodborne pathogens such as *Campylobacter* species, non-Typhi serotypes of *Salmonella enterica*, Shiga toxin-producing strains of *Escherichia coli*, and *Listeria monocytogenes* [40-42]. The zoonotic potential of foodborne pathogens and their ability to produce toxins causing diseases or even death is sufficient to recognize the seriousness of the situation [42,45,48].

Hygiene is a set of practice to preserve health. According to the World Health Organization (WHO), hygiene means conditions and practices that help to maintain health and prevent disease spread. [1-4]. Personal hygiene refers to maintaining body cleanliness. Meat hygiene refers to all conditions and measures necessary to ensure the safety and suitability of meat at all stages of the food chain [7-9]. Inadequate hygiene practices allow consumers to be exposed to pathogens causing public health problems [4-9]. Meat hygiene refers to all conditions and measures necessary to ensure the safety and suitability of meat at all stages of the food chain [4-9]. Inadequate hygiene practices expose consumers to pathogens causing public health problems. Inadequate facilities and hygiene practices in meat shops result in meat contamination [26,29,32,36]. Meat products are highly perishable foods and are consumed daily by many of the population. Meat has been recognized as the chief vehicle in the spread of food-borne illnesses [4-9]. . Meat has appropriate moisture and nutrients which favour the growth of microorganisms which can cause food poisoning and zoonosis like trichinellosis, taeniasis, echinococcosis-hydatidosis [4-9]. Meat hygiene refers to all conditions and measures necessary to ensure meat safety and suitability at all stages of the food chain. Poor handling of raw meat is the primary cause of cross-contamination in developing countries [31,35, 43]. The behavior diagnostic function of considering knowledge and attitudinal dispositions plays an important role in elucidating the dynamics of underpinning food-related diseases as antecedents in meat-hygiene practices among meat handlers, which are very important in providing the needed understanding in addressing emerging issues related to the health and safety of consumers [34,37,39].

An abattoir is a synonym for a slaughterhouse. It is a place where livestock such as pigs, cows, chickens, turkeys, and goats are brought to be butchered and processed for meat. It is a place designed statutorily and designated by approved bodies for the slaughtering of animals, processing, preserving and storing meat and by-products of livestock for human consumption [33,38]. It is commonly known as slaughter houses, slaughter slabs, and places where animals such as cattle, sheep, pigs, and goats are slaughtered. When the general requirements for an abattoir are not met, animals are slaughtered or butchered for food. abattoir facilities undertake a number of operations ranging from the temporary storage of the animals in lairage, pens before proceeding for stunning, bleeding, scalding, skinning, dehairing, plunking, evisceration, Chilling/Hanging of capus and tatus, to washing, cutting/debonning, roasting of the skin, etc. These activities are exclusively dependent upon the adoption of highest sanitary and hygiene principle to safeguard meat food supply from cross-contamination [49]. Consuming meat from sick animals or animals of unknown health history can pose serious health risks to humans [10-12]. It is essential for individuals to be aware of these risks and adopt proper meat hygiene practices to avoid potential health hazards from meat handlers, contact surfaces, contaminated meat and environmental pollution [12-17]. This study assessed the awareness and attitudes of people towards slaughtering of sick animals and meat hygiene in Makurdi metropolis abattoir.

According to the WHO, "approximately 600 million illnesses and 420,000 deaths occur annually due to foodborne diseases" linked to meat-associated hazards [1,18-21]. This study aims to assess awareness and attitudes regarding the slaughtering of sick animals in Makurdi and to determine the extent of proper meat hygiene practices among consumers.

MATERIALS AND METHODS

Study Area

The area of study for this research will be Makurdi Metropolis the capital Benue State and the headquarters of Makurdi Local Government Area (Figure 1). The town is located in the Northcentral region of the country and lies roughly between latitude 6.5° to 7.50° north and longitude 7.50° and 80° east. It is transverse by the River Benue from the west to the east. The river splits the town into the north and south sections on each banks of the river. It officially consists of 11 council wards namely: Malagh, Agan, Ban, Fiidi, North-Bank 1, North-Bank 2, Walomayo, Central South Mission, Modern Market, Clerk Ward, and Ankpa-Wadata Ward. The population of the town comprises people from various parts of the country and even foreigners. The Tiv, Idoma, and Igede however dominate the population. English is the most commonly spoken language in the town followed by Tiv, Idoma, and Igede as other predominant languages.

Makurdi is the capital city of Benue State and the nerve center of commercial activities including the abattoir business. Butchers are found most at the main abattoir in Makurdi located at the foot of the River Benue. Also, there are various abattoir in Makurdi metropolis and their activities include slaughtering, processing, preservation and storage of meat for human consumption.

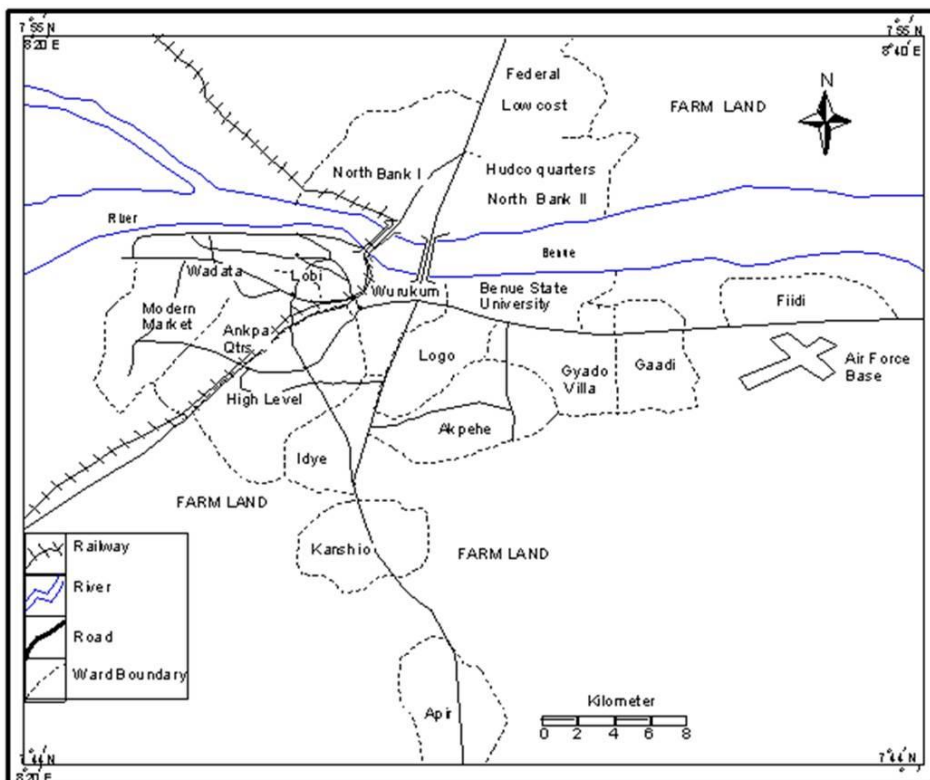


Figure 1: Map of Makurdi Metropolis

Research Design

The study adopted a non-experimental quantitative research design. The reason for choosing the non-experimental quantitative research design was to test their attitude, knowledge, and practice toward slaughtering of sick animals of unknown history and meat hygiene. This was done through the use of a questionnaire.

Target Population

abattoir workers in 12 government approved abattoirs situated in Makurdi metropolis. The inclusion criteria include

The target population included all the 376 registered abattoir workers (Meat Sellers Association, 2023) in Makurdi metropolis that are available as at the time of data collection and are willing to participate in this study while the exclusion criteria for this study are abattoir workers who are not willing to participate in the study and those who were absent were excluded from the study.

Sample Size

A sample represents a subset of the population under investigation. The sample size determines the portion of the population to be observed or studied.

To calculate the sample size, this study employed Yaro Yamane's formula (Baridam, 2001):

$$n = N / (1 + N\delta^2)$$

Where:

n = Sample Size

N = Population Size (376)

δ = Level of Significance (0.05)

Substituting the values:

$$n = 186 / (1 + 186(0.05)^2)$$

$$n = 186 / (1 + 186(0.0025))$$

$$n = 186 / (1 + 0.465)$$

$$n = 186 / 1.465$$

$$n = 127.06$$

$$n \approx 96 \text{ (rounded to the nearest whole number)}$$

Therefore, the sample size for this study is 96.

Data Collection

The research instrument employed for data collection was questionnaire titled: awareness and attitudes of people towards slaughtering of sick animals of unknown history and meat hygiene in Makurdi metropolis abattoir. The questionnaire contained three parts: A, B, and C. Part A contains the introductory letter, Part B contain 8 bio-data details of the respondent and Part C contain 67 items designed to provide answers to the research questions and has three clusters, A, B, C. Cluster A of the questionnaire focused on attitude towards slaughtering of sick animals of unknown history and meat hygiene. Cluster B focused on knowledge of slaughtering of sick animals of unknown history and meat hygiene. Cluster C focused on hygiene practices towards slaughtering of sick animals of unknown history and meat hygiene. The response format for Cluster A to C followed the modified Likert Rating scale containing four response points Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Methods of Data Collection

A letter of introduction was obtained from the office of the Head of the Department of Public Health, National Open University of Nigeria for permission to administer the instrument in the under study. The researcher and two other assistants who were properly briefed administered the questionnaire personally by visiting the four (4) abattoirs. The administration of the questionnaire was carried out on a face-to-face and hand-to-hand basis with the respondents in the abattoir. The researcher began by briefing the respondents about the purpose of the questionnaire and show them how to fill them out. The researcher also assured the respondents of the confidentiality of the information that they will provide to ensure adequate and correct responses from the respondents. The entire process of administration and collecting of instruments lasted for four (4) days. Four Hundred (400) copies of the questionnaire were distributed and 96% (376) retrieved for analysis.

Data Analysis

For data presentation and analysis, the results of the investigation were coded using frequency tables and percentages to enable comparison and clarity of one variable from the other. The percentage were computed by dividing the number of respondents who agreed with the point by the total number of questionnaires that were returned, multiply by a hundred over one as shown in the formula below:

$$\frac{X}{Y} \times \frac{100}{1}$$

Where, X = is the number of responses.

Y = is the number of questionnaires returned.

The data collected were analysed with the aid of Statistical Package for Social Science (SPSS Version 21). The respondents were grouped into two parts (Knowledgeable and Not knowledgeable) based on the score. Those who scored below 65% were classified as having inadequate knowledge, while those who scored above 65% are having adequate knowledge. Those who scored below 50% were classified as having a negative attitude while 50% and above were having a positive attitude toward documentation. Those who scored below 70% were classified as having poor hygiene practice while 70% and above were having good hygiene practice. The one-way ANOVA was used to test the formulated hypothesis. The decision were taken at a 0.05 (95%) significance level.

Ethical Consideration

Permission for the study were obtained from the Head of the Department of Public Health, Faculty of Health Sciences, National Open University of Nigeria. The respondents were adequately informed about the study and its objectives, and their consent were obtained. All information gathered from them were treated with anonymity and confidentiality as the identities of the respondents were kept confidential.

RESULTS

Four hundreds (400) copies of the questionnaires were administered to the selected respondents from the selected abattoirs. The response rate was 94% (376)

Number of Questionnaire (267)	Frequency	Percentage (%)
Returned	376	94
Not returned	24	6
Total	400	100

Source: Field Study, (2023)

Table 1: Socio-Demographic Characteristics of Respondents

Variable		Frequency	Percentage %
Gender	Male	163	43
	Female	213	57
	Total	376	100
Age	18 – 29	113	30
	30 – 39	196	52
	40 and above	67	18
	Total	376	100
Marital Status	Single	116	31
	Married	225	60
	Divorced	35	9
	Total	376	100
Educational Qualification	No Formal	30	8
	Primary	65	17
	Secondary	166	44
	Tertiary	115	31
	Total	376	100
Tribe	Tiv	113	30
	Idoma	34	9
	Igede	17	5
	Hausa	106	28
	Igbo	15	4
	Yoruba	9	2
	Others	82	22
	Total	376	100
Nationality	Nigerian	368	98
	West Africa	8	2

	Total	376	100
Religion	Christianity	183	49
	Islam	109	29
	Traditionalist	49	13
	Freethinker	35	9
	Total	376	100

Source: Field Survey, 2023 (SPSS Version 21)

Sociodemographic characteristics of respondents

Table 1 also revealed that out of the 376 respondents for the study, 163 respondents representing 43% of the respondents were male while 213 respondents representing 57% of the respondents were female. The majority of the respondents were female. This means more female responded to the questionnaire than their male counterparts.

Regarding to the age of the respondents, 113 respondents representing 30% of the respondents were in the age group of 18 – 29 years, 196 respondents representing 52% of the respondents were in the age group of 30 – 39 years, while 67 respondents representing 18% of the respondents were in the age group of 40 years and above. The majority of the respondents were those in the age range of 30 – 39 years.

According to the marital status, 116 respondents representing 31% of the respondents were single, 225 respondents representing 60% of the respondents were married, while 35 respondents representing 9% of the respondents were divorced. The majority of the respondents were married.

Depending on the educational qualification, 30 respondents representing 8% had no formal educational background, 65 respondents representing 17% had a primary school certificate as their highest educational qualification, 166 respondents representing 44% had secondary certificate as their highest educational qualification while 115 respondents representing 31% had tertiary educational certificate as their highest qualification. This implies that the majority of the respondents had a secondary education certificate as their highest qualification.

The result presented in Table 1 revealed that 113 respondents (30%) of the respondents were Tiv, 34 respondents representing 9% of the respondents were Idoma, 17 respondents (5%) of the respondents were Igede, 106 respondents representing 28% of the respondents were Hausa, 15 respondents (4%) of the respondents were Igbo, 9 respondents (2%) of the respondents were Yoruba, while 82 respondents (22%) of the respondents were tribes such as Jukun, Etilo, Ogoja, Egon, Igala, Birom. The majority of the respondents were Tiv and Hausa.

Table 1 also revealed that out of the 376 respondents for the study, 368 respondents (98%) of the respondents were Nigerians, while only 8 respondents (2%) of the respondents were from West Africa. This shows that majority of the respondents were Nigerians.

According to the religion of the responders, the results revealed that 182 respondents (49%) of the respondents were Christian, 109 respondents (29%) of the respondents were Islam, 49 respondents (13%) of the respondents were traditionalist, while 35 respondents (9%) of the respondents were freethinkers. This shows that majority of the respondents were Christians.

Table 2: Consumers’ knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene

Variables	Responses	Frequency	Percentage (%)
Ever heard of meat hygiene?	Yes	376	100
	No	0	0
Ever heard of zoonosis or zoonotic infection?	Yes	353	94
	No	23	6
Can diseases be contacted from eating animal?	Yes	171	45
	No	205	55
It is okay to eat animals of unknown history?	Yes	192	51
	No	184	49
It is okay to eat meat from dead or sick animals?	Yes	281	75
	No	95	25
Is a change in colour, odour, or taste always present in contaminated meat?	Yes	352	94
	No	24	6
Can diseases be contracted from consuming meat from sick animals?	Yes	219	58
	No	157	42
Can hunted animals (bush meat) spread diseases to humans?	Yes	113	30
	No	263	70
Can insects and pests be a source of contamination to raw meat?	Yes	319	85
	No	57	15
Can consumer health be at risk from improper handling of meat?	Yes	352	94
	No	24	6
Total		376	100

Source: Field Survey, 2023 (SPSS Version 21)

The results presented in Table 2 revealed that out of the 376 respondents for the study, all the respondents 376 (100%) agreed that they heard of meat hygiene; 353 (94%) agreed they have heard of zoonosis or zoonotic infection while 23 (6%) have not; 171 (45%) agreed that diseases can be contacted from eating animal while 205 (55%) disagreed; 192 (51%) agreed that it is okay to eat animals of unknown history while 184 (49%) disagreed; 281 (75%) agreed that it is okay to eat meat from dead or sick animals while 95 (25%) disagreed; 352 (94%) agreed that a change in colour, odour, or taste always present in contaminated meat while 24 (6%) disagreed; 219 (58%) agreed that diseases can be contracted from consuming meat from sick animals while

157 (42%) disagreed; 113 (30%) agreed that hunted animals (bush meat) can spread diseases to humans while 263 (70%) disagreed; 319 (85%) agreed that insects and pests can be a source of contamination to raw meat while 57 (15%) disagreed; Most of the respondents 352 (94%) agreed that consumer health can be at risk from improper handling of meat, while 24 (6%) disagreed.

Table 3: Distribution of Respondents by their level of knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene

	Frequency	Percentage (%)
Adequate knowledge	139	37
Inadequate knowledge	237	63
Total	376	100

Source: Field Survey, 2023 (SPSS Version 21)

Table 3 revealed that 139 (37%) of the respondents had an adequate knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene, while 237 (63%) of the respondents which represented the majority of the respondents had an inadequate knowledge.

Table 4: Consumers' attitudes towards consuming sick animals or animals of unknown health history and meat hygiene

Variables	Responses	Frequency	Percentage (%)
Do you pay attention to meat handler's appearance before you purchase meat from abattoir worker?	Yes	324	86
	No	52	14
Do you pay attention to meat handler's health status before you purchase meat from abattoir worker?	Yes	192	51
	No	184	49
Do you inspect the health status of the animal before purchasing and consumption?	Yes	128	34
	No	248	66
Do you physically inspect the environmental condition before you purchase meat from abattoir workers?	Yes	307	82
	No	69	18
Do you ask for license or inspect meat quality before purchasing?	Yes	88	23
	No	288	77
Do you inspect meat quality before purchasing?	Yes	366	97
	No	10	3
Do you inspect the nature of water being used to wash the meat?	Yes	87	23
	No	289	77

Do you physically inspect the slab and utensils used before you purchase meat from abattoir workers?	Yes	309	82
	No	67	18
What would you do, if you perceive some odor in meat that you have paid high amount for. Will you throw it away?	Yes	345	92
	No	31	8
When you observe a plaster on the finger of the meat seller, do you buy meat from him or her?	Yes	97	26
	No	279	74
Total		376	100

Source: Field Survey, 2023 (SPSS Version 21)

The result presented in Table 4 reveal that out of the 376 respondents for the study, 324 (86%) pay attention to meat handler's appearance before they purchase meat from abattoir worker while 52 (14%) do not; 192 (51%) pay attention to meat handler's health status before they purchase meat from abattoir worker while 184 (49%) do not; 128 (34%) inspect the health status of the animal before purchasing and consumption while 248 (66%) do not; 307 (82%) physically inspect the environmental condition before they purchase meat from abattoir workers while 69 (18%) do not; 88 (23%) ask for license or inspect meat quality before purchasing while 288 (77%) do not; 366 (97%) inspect meat quality before purchasing while 10 (3%) do not; 87 (23%) inspect the nature of water being used to wash the meat while 289 (77%) do not; 309 (82%) physically inspect the slab and utensils used before they purchase meat from abattoir workers while 67 (18%) do not; 345 (92%) would throw away the meat they paid high amount for if they perceive some odour while 31 (8%) would not; 97 (26%) would buy meat from abattoir worker if they observe a plaster on the finger of the meat seller while 279 (74%) would not.

Table 5: Distribution of Respondents by their level of attitudes towards consuming sick animals or animals of unknown health history and meat hygiene

	Frequency	Percentage (%)
Positive attitude	196	52
Negative attitude	180	48
Total	376	100

Source: Field Survey, 2023 (SPSS Version 21)

Table 5 revealed that 196 (52%) of the respondents had positive attitude towards consuming sick animals or animals of unknown health history and meat hygiene, while 180 (48%) of the respondents had a negative attitude which mean that more than a half of the respondents had positive attitude towards consuming sick animals or animals of unknown health history and meat hygiene.

Table 6: Consumers' practices of processing meat and meat hygiene

Variables	Responses	Frequency	Percentage (%)
Do you eat or drink while processing meat?	Yes	129	34
	No	247	66

Do you use gloves while processing meat?	Yes	151	40
	No	225	60
Do you wash your hands before and after processing meat?	Yes	376	100
	No	0	0
Do you wear an apron, cap, and mask while processing meat?	Yes	166	44
	No	210	56
Do you wear nail polish when processing meat?	Yes	58	15
	No	318	85
Do you properly wash the meat with salt and clean water before cooking?	Yes	376	100
	No	0	0
Do you properly clean the meat storage area before storing meat?	Yes	364	97
	No	12	3
Do you sterilize your utensils before and after meat processing?	Yes	176	47
	No	200	53
Do you handle/process meat when you have cuts, wounds, bruises or injuries on your hands?	Yes	112	30
	No	264	70
Total		376	100

Source: Field Survey, 2023 (SPSS Version 21)

The result presented in Table 6 reveal that out of the 376 respondents for the study, 129 (34%) eat or drink while processing meat while 247 (66%) do not; 151 (40%) use gloves while processing meat while 225 (60%) do not; all the respondents 376 (100%) wash their hands before and after processing meat; 166 (44%) wear an apron, cap, and mask while processing meat while 210 (56%) do not; 58 (15%) wear nail polish when processing meat while 318 (85%) do not; all the respondents 376 (100%) properly wash the meat with salt and clean water before cooking; 364 (97%) properly clean the meat storage area before storing meat while 12 (3%) do not; 176 (47%) sterilize their utensils before and after meat processing while 200 (53%) do not; 112 (30%) handle/process meat when they have cuts, wounds, bruises or injuries on their hands while 264 (70%) do not.

Table 7: Distribution of Respondents by their level of practices of processing meat and meat hygiene

	Frequency	Percentage (%)
Good practice	211	56
Bad practice	165	44
Total	376	100

Source: Field Survey, 2023 (SPSS Version 21)

Table 7 revealed that 211 (56%) of the respondents had a good practice of processing meat and meat hygiene, while 165 (44%) of the respondents had a bad practice which reveals that more than a half of the respondents had a good practice of processing meat and meat hygiene.

DISCUSSION

Consumers' knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene

The hypothesis of the study reveals that there is a significant relationship between age, marital status, education, tribe, religion, and their level of knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene at the $p < .05$ level while there is no significant relationship between gender, nationality and their level of knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene at the $p < .05$ level. The results of this study are in consent with those of Bello et al. (2023), who found that the majority of respondents in Uyo Metropolis knew very little about meat safety. Their age, years of experience working in an abattoir, and degree of education were all strongly correlated with their lack of understanding. The hygienic and food safety understanding of carcass handlers was found to be inadequate (Bahir et al., 2023). They observed that the personnel were ignorant of the poisoning of the carcasses. Tegegne and Phyo (2017) found that the most common areas of inadequate understanding among meat handlers were cross-contamination, temperature control, food-borne infections, and the distinction between cleaning and sanitation. They suggested that the high percentage of meat handlers in the research area who are illiterate and dropped out of primary school could be the cause.

The results of this study, however, do not consent with those of Agu et al. (2021) study, which indicated that 75% of respondents knew enough about appropriate meat hygiene procedures. Personnel in Kebbi State's raw meat value chain demonstrated a considerable level of meat hygiene awareness, according to a study conducted in 2021 by Ribah et al. similar findings were made by Izunobi et al. (2023), who found that Owerri west LGA abattoir employees knew a fair amount about cleanliness practices.

Consumers' attitudes towards consuming sick animals or animals of unknown health history and meat hygiene

The hypothesis of the study reveals that there is a significant relationship between gender, age, marital status, education, tribe, religion, and their attitudes towards consuming sick animals or animals of unknown health history and meat hygiene at the $p < .05$ level while there is no significant relationship between nationality and their attitudes towards consuming sick animals or animals of unknown health history and meat hygiene at the $p < .05$ level. The results of this study are in line with those of Izunobi et al. (2023), who found that respondents had a generally good opinion regarding cleanliness practices. According to Kehinde et al. (2020), a majority of meat handlers in Lagos State (53.1%) exhibited a good attitude towards meat cleanliness. In a similar vein, Sarma et al. (2022) discovered that more than half of carcass handlers had a positive outlook on food safety. According to Tegegne and Phyo (2017), meat handler attitudes can have an impact on food safety practices in order to reduce outbreaks of food-borne illnesses. A substantial correlation between positive attitudes and safe food handling habits was noted (Akabanda et al., 2017).

Consumers' practices of processing meat and meat hygiene

The hypothesis of the study reveals that there is a significant relationship between gender, age, marital status, tribe, religion, and their practices of processing meat and meat hygiene at the $p < .05$ level while there is no significant relationship between education, nationality and their practices of processing meat and meat hygiene at the $p < .05$ level. The results of this investigation are in line with those of Agu et al. (2021), who discovered that 85.6% of the participants followed appropriate hygiene practices. According to Izunobi et al. (2023), the respondents' hygiene practices are comparatively good. Similarly, Kehinde et al., (2020) found that majority of meat handlers in Lagos State had effective practice (66.6%) of meat hygiene. Less than half (44.4%) of meat handlers had adequate meat hygiene standards, according to Bhandari et al. (2022). According to Saud et al.

(2023), there was no significant correlation found between the hand hygiene practices followed by using the lavatory and wearing gloves, and the mean bacterial count.

However, Bello et al. (2023) found that most respondents in Uyo city had inadequate meat safety practices. Furthermore, Ribah et al. (2021) discovered extremely inadequate meat cleanliness in Kebbi State's main slaughter slabs. They suggested educating operators about contemporary, safer, and more hygienic abattoir goods. According to Enem (2017), the study's findings indicate that the Gwagwalada abattoir's general and personal hygiene standards are deplorable.

The data indicates a troubling trend: a majority of respondents possess inadequate knowledge regarding meat hygiene and the health risks of consuming sick animals. Many respondents incorrectly believe that eating contaminated meat poses no health risks. In fact, "over half acknowledged a positive attitude towards consuming sick animals, reflecting gaps in public health awareness. [49-55]. Furthermore, the failure to inspect meat quality, inquire about licenses, and evaluate the washing methods employed diminishes safety. Despite some good practices, substantial negligence persists, placing public health at risk.

The study revealed that a majority of the respondents had inadequate knowledge of the risks associated with consuming sick animals or animals of unknown health history and meat hygiene [50-55]. Most respondents believed that consuming animals of unknown history was safe and that diseases cannot be contracted from eating animals [49-52]. While more than half of the respondents had positive attitudes towards consuming sick animals or animals of unknown health history and meat hygiene [52-55], many did not inspect meat quality or the water used to wash the meat before purchasing [49-55]. Additionally, a large number of respondents did not wear protective gear while processing meat [49-51].

CONCLUSION

This study underscores a profound lack of awareness and inadequate attitudes among consumers regarding the risks of consuming sick animals and meat hygiene. Given these findings, it is crucial for public health stakeholders to implement educational programs addressing meat hygiene and best practices.

RECOMMENDATIONS

It is crucial for the government and non-governmental organizations to conduct educational campaigns to raise public awareness about the risks associated with consuming sick animals or animals of unknown health history and the importance of meat hygiene practices. Additionally, regulations should be enforced to ensure that proper meat processing standards are followed to protect public health. By promoting awareness and encouraging proper meat hygiene practices, we can reduce the risk of disease transmission through consumption of noncontaminated meat [49-55].

Declaration of patient consent Patients' consent not required as there are no patients in this study.

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Conflicts of interest: There are no conflict of interest.

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