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Sanitary conditions of abattoirs in Ibadan, Southwest Nigeria

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Abstract

Background: The environment in the abattoir is of public health concern because of its implications on the quality of meat sold in the markets. The poor sanitary states of abattoirs have been reported in the literature. Very few studies have provided a comprehensive assessment of the sanitary conditions in the abattoir premises. This study sought to assess the compliance of abattoirs in Ibadan, Southwest Nigeria with standards set by Federal Ministry of Environment.

Methodology: A descriptive cross-sectional study was conducted in Ibadan using an observational checklist adapted from Policy guidelines on market and abattoir sanitation by the Federal Ministry of Environment. Twelve (12) abattoirs in Ibadan metropolis were assessed. Data obtained were analyzed using descriptive statistics.

Results: Concerning general inspection, only one (8.3%) of the abattoirs had adequate access route, potable water supply and functional drainage system. Many had poor solid waste management practices as heaps of refuse littered the surroundings. Internal inspection of the abattoirs revealed that two (16.7%) had adequate space and facilities. Ten (83.3%) had first aid posts even though they were not equipped with materials. Eleven (91.7%) abattoirs had toilet facilities that were either poorly kept or abandoned.

Conclusion: This study showed that most of the abattoirs in Ibadan metropolis were operating under unhygienic and sub-standard conditions and lacked basic requirements for a good abattoir as stipulated in the Policy Guidelines on Market and Abattoir Sanitation. There is an urgent need to enforce the minimum standards as stipulated in the policy guidelines.

Keywords: *Abattoirs, Sanitary conditions, Ibadan, Inspection*

Résumé

Introduction : L'environnement de l'abattoir est un souci de santé publique à cause de ses implications sur la qualité des viandes vendues dans les marchés. Les pauvres états sanitaires des abattoirs ont été reportés dans les littératures. Très peu d'études ont procurés une répartition compréhensive des conditions sanitaires dans les lieux d'abattoir. Cette étude cherchait à repartir la complaisance des abattoirs à Ibadan, Sud Ouest Nigeria avec les standards mis en place par le Ministère Fédéral de l'Environnement.

Méthode : Une étude descriptive à cross section était menée à Ibadan en utilisant une liste pratique de contrôle adaptée des guides Politiques sur la propreté du marché et de l'abattoir par le Ministère Fédéral de l'Environnement. Douze (12) abattoirs étaient répartir dans la métropole d'Ibadan. Les données obtenues étaient analysées en utilisant la statistique descriptive.

Résultats : Concernant l'inspection générale, seulement un (8,3%) des abattoirs avait un accès routier adéquat, approvisionnement de l'eau potable, et un système de drainage fonctionnel. Nombreux avaient pauvre pratiques du management des débris solide puisque les tas de débris étaient en désordre partout dans les entourages. L'inspection interne des abattoirs révélait que deux (16,7%) avaient espace et facilités adéquats. Dix (83,3%) avaient un poste de premier soin bien qu'ils n'étaient pas suffisamment équipés avec les matériels. Onze (91,7%) abattoirs avaient des facilités de toilette qui étaient soit mal maintenues ou abandonnées.

Conclusion : Cette étude montrait que la plupart des abattoirs dans métropole d'Ibadan opèrent sous des conditions non hygiénique et sous-standard et manquaient les qualités de base pour un bon abattoir comme stipulé dans les guides Politiques sur la propreté du marché et de l'abattoir par le Ministère Fédéral de l'Environnement. Il ya un besoin urgent a enfoncer les standards minimum comme stipulé dans les guides Politiques.

Mots Clé : *Abattoirs, Conditions Sanitaire, Ibadan, Inspection.*

Introduction

Meat sold in markets in Ibadan is prepared in abattoirs within the municipality. An abattoir or slaughterhouse is a place where animals are killed in a sanitary condition to ensure its safety and wholesomeness for human consumption [1]. In Nigeria, slaughterhouses are small private businesses while abattoirs are bigger, serve communities of appreciable population size and are usually owned by Government. The nature of activities in abattoirs and slaughter houses involves the spillage of blood,

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body fluids and animal excreta in the environment. Consequently, the environment in the abattoir poses a challenge to public health because of the implications for the quality of meat sold in markets. The sanitary conditions will influence the level of environmental hygiene in these premises. This will also influence the meat handling practices of butchers and ultimately determine the quality of meat sold in the market.

The poor sanitary state of abattoirs have been reported in the literature [2-4]. These conditions exist in spite of the existing framework for minimum standards for sanitation in Markets and Abattoirs [1]. The Guidelines have provided a tool for assessing compliance with these standards. The checklist can easily be applied to achieve an objective assessment of the state of water supply, drainage and environmental cleanliness in the abattoir. A study in Ibadan focused on a major abattoir in the metropolis, the Bodija abattoir and reported that pipe borne water was not available and that water from twelve wells in this abattoir was contaminated with bacteria [2]. It is possible that the poor condition reported in this abattoir is a reflection of the state of other abattoirs in Ibadan.

Most reports on abattoirs have focused on an aspect of the environmental health problems such as waste disposal, water supply or quality of meat sold. Very few studies have provided a comprehensive assessment of the sanitary conditions in the abattoir premises. This study sought to assess compliance with FME Guidelines in abattoirs located in Ibadan municipality.

Materials and method

Study area

The study was conducted in Ibadan, Southwest Nigeria. Ibadan is one of the major urban cities in Nigeria; the largest indigenous city in West Africa with a population of about two million people. The population is largely engaged in farming, trading and service occupations. The city of Ibadan has 11 local government areas (LGAs) comprising 5 urban and 6 semi-urban areas. There are a total of twelve abattoirs located in 8 of the 11LGAs in Ibadan metropolis. The functioning abattoirs within Ibadan metropolis are distributed in the local government areas as follows: OnaAra (3), Egbeda (3), Akinyele (1), Lagelu (1), Oluyole (1), Ibadan Southeast (1), Ibadan Southwest (1), Ibadan Northwest (0), Ibadan North (1) [5].

Data collection methods

A descriptive cross-sectional study was conducted to assess the sanitary conditions at the abattoirs using an observational checklist adapted from Pc Guidelines on Market and Abattoir Sanita developed by the Federal Ministry of Environ [1]. The checklist comprised of three sections and C. Section A was used for general inspe which includes: state of access route, surround refuse disposal, presence of dangerous excava and status of drainages. Section B was use internal inspection. This involved observation c basic infrastructures for adequacy of space, ligh ventilation, cleanliness and maintenance; availal of lairage and bathroom accommodation for wor Other items observed were walls, roofs, ceiling floors of abattoirs, containment of wastewater, r management and toilet facilities. Hand was facilities and equipment and fittings were inspected in all the abattoirs under this sec Section C was used for other areas such as pres of birds and stray animals in the abattoir prer and availability/use of personal protec equipment.

The Observational checklist was used b researchers and trained research assistants. Tv (12) abattoirs in Ibadan metropolis including each in OnaAra and Egbeda LGA and one ea Akinyele, Lagelu, Oluyole, Ibadan Southeast, Ib Southwest and Ibadan North Local Governi Areas were assessed using one checklist for abattoir. The chairman or secretary of the associ of butchers in each abattoir conducted the res team to the various areas of the abattoi inspection. Data was entered and analyzed u SPSS version 21. Descriptive statistics computed and presented using proportions tables.

Results

A total of 12 abattoirs were visited including each in Ona Ara and Egbeda LGA and only o each of Akinyele, Lagelu, Oluyole, Ibadan South Ibadan Southwest and Ibadan North L Government Areas.

General inspection of abattoirs

Details of findings are shown in Table 2. Re show that out of the 12 abattoirs, only one (8. had adequate access route. In ten (83.3%) of abattoirs, solid waste management was very po heaps of refuse littered the surroundings. As s seven (58.3%) of the abattoirs had heaps compri refuse, cow dung and human faeces. Only (16.7%) had adequate solid waste managen system. At Moniya abattoir (Akinyele LGA) Bodija Abattoir (Ibadan North LGA), the heaps

Table 1: Description of selected key items observed during inspection

Item observed	*Description*	*Definition*
State of access route	Adequate	Tarred, motorable entrance and exit road path or free and easy access to abattoir site
	Inadequate	Untarred (rough) road, tarred with pot-holes, difficult access, road blocked by market stalls on one or both sides of access road
Surroundings	Well kept	Neat
	Dirty	Surrounding swampy, dirty, and littered with nylon, paper or debris
Heap of refuse	Not observed	Not seen
	Observed	Mainly refuse plus cow dung
	Observed	Mainly refuse, cow dung with human faeces
Stagnant water	Not observed	Not seen
	Observed	Stagnant water and refuse in observed blocked drainage
Dangerous excavation	Not observed	Not seen
	Observed	Defective septic tank filled and non-functional
Drainage status	Adequate	Available and functional
	Inadequate	Poorly constructed, blocked with stagnant water/refuse
	No drainage	No facility for draining wastewater
Layout	Adequate	No overcrowding
	Inadequate	Inadequate space, overcrowding occur in the layout
Lairage	Functional/non-functional	Yes/No
	Yes/No	Separate accommodation provided for healthy and sick animals
Lighting and ventilation	Light source available, room well lit	
	Light source available, poor ventilation	
	Light source not available, poor ventilation	
	(No single light source, window dilapidated, room dark)	
Toilet facility	Available/not available	
	Functional, clean	
	Functional, dirty	
	Abandoned	
Hand washing facilities	Available, not available	
Bathroom accommodation	Available, functional	
	Available, no longer functional, turned to stores and/or hideout)	
	Not available	

Table 2: General Inspection of Abattoirs

Items (N = 12)	Frequency	Percentage
State of access route		
Adequate	1	8.3
Inadequate	11	91.7
Surroundings		
Well kept	-	-
Dirty	12	100.0
Heaps of refuse		
Not observed	2	16.7
Observed (mainly refuse with cow dungs)	3	25.0
Observed (refuse, cow dungs, human faeces)	7	58.3
Stagnant water		
Not observed	1	8.3
Observed	11	91.7
Dangerous excavations including defective septic tanks		
Not observed	9	75.0
Observed	3	25.0
Drainage status		
Adequate	1	8.3
Inadequate	11	91.7
No drainage system	-	-

refuse were mostly cow dung, although human faeces was seen close to the abattoir. Stagnant water was observed within the surrounding of 11 (91.7%) of the abattoirs. Only three (25.0%) of all the abattoirs had dangerous excavations including defective septic tanks. On the state of drainage in the abattoirs, only one (8.3%) abattoir was found to be in good condition.

the private slaughter house. Majority of the abattoirs (75%) were without physical structure (did not have walls or roofs) while 16.7% abattoirs had walls that were dirty. Observation also revealed that only 3 (25.0%) abattoirs had clean floor. Concerning first aid post, only 10 (83.3%) abattoirs were observed to have first aid posts even though all the abattoirs did not have first aid materials and personnel.

Table 3: Internal Inspection of Abattoirs

Items (N = 12)	Frequency	Percentage
Layout-Adequacy of space and facilities		
Adequate	2	16.7
Inadequate	10	83.3
Availability of functional lairage		
Yes	2	16.7
No	10	83.3
Separate lairage provided for healthy and sick animal (N=2)		
Yes	-	-
No	2	100.0
Lighting and ventilation		
Light source available, room well lit	1	8.3
Light source available, poor ventilation	4	33.3
No light source, poor ventilation	7	58.4
Cleaning and repair		
Yes (observed)	1	8.3
No (not observed)	11	91.7
Wall		
Available, clean	-	-
Available, dirty	3	25.0
Not available	9	75.0
Roof and ceiling		
Available (dirty)	3	25.0
Not available	9	75.0
Floor		
Clean	3	25.0
Dirty	9	75.0
First Aid Post		
Available	10	83.3
Not available	2	16.7
First aid materials e.g antiseptic, bandage, cotton wool (N=10)		
Yes	0	0.0
No	10	100.0
First Aid personnel	Nil	0.0

Internal inspection of abattoirs

Table 3 shows the result of internal inspection of all the abattoirs. Only two (16.7%) of the abattoirs had adequate space and facilities. Concerning lairage condition, only two (16.7%) were functional. Even where there were lairages, both sick and healthy animals were kept together in the same lairage. The only abattoir with good lighting and ventilation was

Table 4 shows that nine (75.0%) abattoirs had problems with management of wastewater. Most of the drainages were filled with refuse thus causing wastewater to stagnate. Of all the abattoirs, only two (16.7%) had source of water supply. The source of water supply in one of the abattoirs was an insanitary well, while the borehole available in another one was not functional. Even though toilet facility were

Table 4: Sanitation facilities

Items (N = 12)	Frequency	Percentage
Containment of wastewater		
Channeled into functional drainages	1	8.3
Channeled into nearby stream	2	16.7
Channeled into blocked drainages	9	75.0
Toilet facilities		
Available	11	91.7
Not available	1	8.3
Functional status of toilet facilities (N=11)		
Functional, clean	-	
Functional, dirty	1	9.1
Not functional (abandoned)	10	90.9
Hand washing facilities		
Available	11	91.7
Not available	1	8.3
Bathroom accommodation		
Available	9	75.0
Not available	3	25.0
Facility for refuse disposal		
Available	2	16.7
Not available	10	83.3
On site waste treatment		
Available	2	16.7
Not available	10	83.3
Equipment and fittings		
Available	7	58.3
Not available	5	41.7
Functionality of equipment and fittings (N=7)		
Functional, requires minor repairs	3	42.8
Functional, requires major repairs	4	57.2
Not available	5	41.7

Table 5: Other Inspection at abattoirs

Items (N = 12)	Frequency	Percentage
Presence of birds and stray animals in the premises		
Not observed	7	58.3
Observed	5	41.0
Personal Protective Equipment Overall		
Available	-	-
Not available	12	100
Head cover		
Available	-	-
Not available	12	100
Boots		
Available	-	-
Not available	12	100

available in 11 (91.7%) of the abattoirs inspected, none of them was optimally functional. Hand washing facilities were observed in eleven (91.7%) of all the abattoirs even though only 1 (8.3%) was found to be adequately equipped for hand washing. Nine (75.0%) abattoirs were found to have bathroom accommodation. However, only one (8.3%) which was a private slaughter house was functional. In some of the places where bathroom accommodations was no longer functional, they had been turned to stores.

Other inspection at the abattoirs

Details of other inspections are shown in Table 5. Birds and stray animals were present in the premises of seven (58.3%) of all the abattoirs observed. It was also observed that personal protective equipment like overall, head cover and boots were not available in the 12 (100%) abattoirs inspected.

Discussion

The provision of abattoirs is of essence in ensuring availability of meat for the populace; however, maintenance of hygiene is essential in protecting public health. The results from this study show that most of the abattoirs in Ibadan metropolis are operating under unhygienic and sub-standard conditions and lacked basic amenities as stipulated in the Policy Guidelines on Market and Abattoir Sanitation. The reports from studies in other parts of the country are similar to that obtained in this study. Bello and Oyedemi [4] concluded that there was no special waste disposal system or treatment in the abattoir at Ogbomosho. They also noted that dung was piled up and wastewater containing blood and dung was discharged into a nearby stream without treatment thus resulting in pollution of surface and underground water for the abattoir and residents in the vicinity of the abattoir. Unhygienic conditions in abattoirs have implications for public health as that may be an avenue for transmission of diseases.

Presence of birds and stray animals in more than 50% of the abattoirs has implications for the transmission of zoonotic diseases. A study by Mellau and others [6] confirmed that high prevalence of Hydatid Cysts (HC), a disease condition affecting the liver of cattle, sheep and goats, is a potential threat to humans in Tanzania. This was attributed to the presence of a large population of stray dogs and improper disposal of condemned organs in abattoirs in the country.

Mkupasi and others [7] studied the prevalence of extra-intestinal porcine helminth infections and assessed the sanitary conditions of pig slaughter slabs in Dar es Salaam city, Tanzania. They concluded that the slaughter slabs were operating under unhygienic conditions with questionable safety, soundness and wholesomeness of the pork produced because of inadequate slaughtering, disposal and cleaning facilities.

In this study, inspection of the sanitation facilities showed that equipment and fittings were inadequate; floors were defective and required major corrective actions. The unhygienic situation observed in the abattoirs in Ibadan is similar to studies in other parts of the country [8, 2] and Africa [7]. Investigation by Stiles and Ng [9] on the type of Enterobacteriaceae associated with meats and meat handling work surfaces and retail outlets in Canada showed that Escherichia coli biotype I and *Serratia liquefaciens* were detected at all stages of meat handling, while *Klebsiella pneumoniae* was a frequent isolate in the packing plant but not the retail outlet, thus highlighting the possibility of using *K. pneumoniae* to signal unhygienic handling of meats at the retail level. In Nigeria, Uche and Agbo [10] found multi-bacterial contamination of butchers' hands, knives, tables and meat at Nsukka meat market and proceeded to discuss the public health implications of such contaminations

This study also found that wastewater and solid wastes were discharged into drainages which are channeled directly to near-by streams, while blocked drainages are capable of breeding mosquitoes and other disease vectors. In places where toilets were available, they were not functional. On-site waste treatment facilities were not available in the abattoirs. Resources from wastes generated were not harnessed. In all the abattoirs visited, safety at workplace was not taken into consideration as no provision was made for first aid materials and most workers/butchers did not use protective equipment.

In conclusion, there is an urgent need to enforce the minimum standards as stipulated in the policy guidelines for markets and abattoirs. Awareness campaign and health education interventions should therefore be promoted among butchers, market women and environmental health officers. Government needs to put more funding into sanitation facilities in abattoirs. Waste generated in the abattoirs can be used to generate biogas, electricity and compost for agricultural use. This can enhance revenue generation for the maintenance of abattoirs.

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