Evaluation of Infrastructure and Animal Supply Logistics of the Abattoir in Ado Local Government Area of Ekiti State, Nigeria

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Abstract

Ado Local Government Area (LGA) is the only LGA in Ekiti State that has standard abattoir. This study was conducted to evaluate the infrastructural facilities, nature of stakeholders and animal supply logistics as factors of service quality in the abattoir operations. Fifty (50) stakeholders were randomly selected as respondents to well-structured questionnaire and interview schedule on the activities in the abattoir. The respondents were mainly males (90%), married (86%), and aged 30-49 years (58%) and with fairly high literacy level (60 and 20% had secondary and tertiary education respectively). The functionality of the lairage, slaughter hall and slab were rated as fair and satisfactory by 6 and 50% of the respondents respectively; the cold room and condemned rooms were not functional while 98% rated the rail system as bad. There was no electricity supply while water availability and reticulation were poor. The average of 60 animals slaughtered weekly consisted of White Fulani (41.3%), Sokoto Gudali (30.3%) and Red Bororo (23.9%) sourced from neighbouring states at ₦51,000-90,000 (30%) and ₦91,000-130,000 and transported in trucks/lorries. The carcass/cut parts are transported through unconventional means. Ante-mortem and post-mortem inspections are carried out by qualified personnel who recorded Fasciolias is (48%), Tuberculosis (42%) and Foot and mouth disease (8%) as the most prevalent. The infrastructure and management need improvement while the butchers should be trained in animal handling, slaughtering and meat processing procedures to enhance meat hygiene and revenue generation in the abattoir.

Keywords: Abattoir, infrastructure, cattle, diseases, breed, stakeholders, law, policy

Introduction

Man has shown considerable level of concern to the quality of meat he consumes right from the days of ancient civilization in Egypt when laws enacted categorised pig and cow meat as unclean meat for human consumption and sacred respectively (David-West, 2002). In Nigeria, the attempt to monitor the quality of meat started in 1967 and the Legislation for Meat Inspection passed in 1970 (David-West, 2002). This has led to the evolvement of various edicts for meat hygiene for live animals (ante-mortem) and slaughtered ones (post-mortem) in the supply chain of meat to the public. The quality and standard of foods in Nigeria has been a serious concern to virtually all the stakeholders namely, the government that formulate policies, professionals in the livestock industry (animal scientists, veterinarians, marketers, butchers, food scientists, environmentalists and the consumers). This is against the backdrop of observable lapses in the provision of adequate facilities for meat production and even where they exist it is flawed with poor level of hygiene.

Farm animal slaughtering and processing at most abattoirs in Nigeria are largely of traditional settings (where slaughtering and processing is done near streams or rivers that basically serve as sources of potable water and waste disposal in the same location) despite the various existing laws promulgated to ensure safety of meat from the abattoirs (Adesemoye *et al.*, 2006; Nwanta *et al.*, 2008). This is as a result of inadequate availability of modern facilities and proper training of the stakeholders who, in most instances, are still attached to the inefficient traditional techniques. The supply of animals for slaughtering and the entire abattoir chain process to meet requisite standard for the production of quality meat for public consumption needs more to be desired even

where such facilities exist.

The 1999 Federal Constitution empowers every state in Nigeria to establish, operate and maintain abattoirs under their respective Local Government Areas (LGAs). The drive for increased internally-generated revenue in the states and political styles of successive administrations has incapacitated the LGAs in the performance of these statutory functions. The service quality output in abattoirs, slaughter houses or slabs has been a factor of the availability of credible sources of supply of the animals, qualification or training exposure of the

Materials and MethodsDescription of the study location

The study was carried out in Ado LGA of Ekiti State in the south western Nigeria. The state capital, Ado-Ekiti, mainly comprises the entire LGA but there are about 64 adjoining villages, farmsteads and quarters (www.ekitistate.gov.ng). The population was 313,690 according to the 2006 Population Census (NPC, 2017). The town is located on longitude 5°16'E and latitude 7°40'N and experiences tropical climate characterized by two distinct seasons: wet and dry seasons between March-November and November-March. The ecological features support the rainforest vegetation and the predominant agrarian society.

Data collection and interpretation

The selection of the survey site was by purposive sampling technique while the fifty (50) respondents to well-structured questionnaire and interview schedule were randomly selected within the abattoir premises on personal contact and available information. The management office of the abattoir was also visited to obtain answers on administrative questions. The data were subjected to descriptive statistics of frequency counts, percentages and ranking.

Results

The social status of the 50 respondents/ stakeholders running the day-to-day activities in the Ado-Ekiti abattoir is shown in Table 1. The respondents comprised 90% male and 10% female and most were married (86%). The age distribution showed that most of the respondents were 30-39 years old (34%) followed by 40-49 and 50-59 years old at 24 and 18% respectively.

stakeholders and most importantly, the standard of the facilities for meat production taking cognizance of the hygiene and environmental issues. Out of the 16 LGAs in Ekiti State, Ado LGA is the only one in which standard abattoir/slaughter slab exists. This study was a survey of the abattoir, slaughter hall and slaughter slabs with a view to evaluating the functionality and efficiency of the facilities available, sources of supply of the animals and the nature of the stakeholders involved in the meat processing chain.

Only 2 and 6% of the respondents belonged to 20 and 60 years respectively. Most of the respondents/stakeholders (60%) had secondary school education, 20% attended tertiary institutions and 16% had primary school education while 4% did not have formal education.

A breakdown of the stakeholders shows the following:

1. Marketers- are the people engaged in buying from the merchants but sell to the butchers and others. They usually operate kraals where the animals are kept in the cattle market. They constituted 2% of the respondents.

2. Butchers- are involved in the slaughtering, processing of the meat and retail of carcass or meat to the public. The butchers were 72% of the respondents.

3. Livestock Officers- are public officers, usually qualified Animal Scientists, involved in the management/administration of the abattoir at various levels and constituted 8% of the respondents.

4. Veterinary Surgeons/Animal Health Officers- are public officers responsible for health and other hygiene management issues such as inspection of meat and disease control at the abattoir. They were 8% of the respondents.

5. Revenue Officers- made up 2% of the respondents/stakeholders and are public officers or Consultants with the responsibility of collecting revenue in the form of rates and taxes for the government.

6. Cleaners- are responsible for cleaning the abattoir environment on daily basis after

usage and made up 2% of the respondents

7. Gardeners- constituted 2% of the respondents and with the main function of weeding, maintaining the environment and ensuring it is not bushy.
Security- made up 2% of the respondents and to guard and secure the premises.

Table 1: Social status of the stakeholders in Ado-Ekiti abattoir

Sub-title	Frequency	Percentage	Ranking
Gender			
Male	45	90	1
Female	5	10	2
Marital status			
Married	43	86	1
Widowed	7	14	2
Single	-		-
Divorced	-		-
Age (years)			
<20	1	02	6
20 – 29	8	16	4
30 – 39	17	34	1
40 – 49	12	24	2
50 – 59	9	18	3
>60	3	06	5
Educational status			
No formal education	2	04	4
Primary education	8	16	3
Secondary education	30	60	1
Tertiary education	10	20	2
Types of stakeholders			
Marketer(s)	1	02	4
Butchers	36	72	1
Livestock Officers	4	08	2
Veterinary Surgeon/Animal Health Officer	4	08	2
Revenue Officer/Consultant/Manager	1	02	4
Cleaner (s)	1	02	4
Gardener	1	02	4
Security	1	02	4

The functionality of the infrastructural facilities in the abattoir: lairage, slaughter hall or slabs and others as listed in Table 2 was rated as "Good", "Fair", "Bad" and "Satisfactory." The lairage was rated as fair or good by 36% and 28% respectively while 26% opined that it was just satisfactory. The slaughter hall/slab was fair to good by 6% and 44% respectively while 50% rated it as satisfactory. Almost all the respondents (98%) rated the rail system/hangers for meat processing as bad or non-existent while the cold/chilling room, detained room, condemned room were present but adjudged as bad by 49% and 50% of the respondents respectively.

Table 2 Infrastructural facilities available in the abattoir

Facilities & functionality	Availability	Frequency	Percentage	Ranking
a. Lairage				
i. Good		14	28	2
ii. Fair		18	36	1
iii. Bad		5	10	4
iv. Satisfactory		13	26	3
b. Slaughter slab				
i. Good		22	44	2
ii. Fair		3	6	3
iii. Bad		0	0	4
iv.		25	50	1
c. Rail system/Hangers				
i. Good		0		
ii. Fair	X	1	2	2
iii. Bad		49	98	1
iv. Satisfactory		0		
d. Cold/Detained/condemned Rooms	X			
i. Good		0	0	4
ii. Fair		0	0	4
iii. Bad		50	100	2
iv. Satisfactory		0	0	4
e. Drainage system				
i. Good		15	30	2
ii. Fair		22	44	1
iii. Bad		1	4	2
iv. Satisfactory		12	24	3
f. Water system				
i. Good		19	38	1
ii. Fair		16	32	2
iii. Bad		3	6	4
iv. Satisfactory		12	24	3
g. Electricity supply				
i. Good		6	12	2
ii. Fair		4	8	4
iii. Bad		35	70	1
iv. Satisfactory		5	10	3
h. Hides & skin? Disinfection facilities/First aid/Fire prevention				
i. Good	X	01	2	2
ii. Fair		49	98	1
iii. Bad		0		
iv Satisfactory		0		
Cleaning of the abattoir				
Regularly after operation	47	94	1	1
Occasionally after operation	3	6	2	2

The drainage system was rated as good and fair by 30 and 44% of the respondents respectively. The availability of water at the abattoir was rated good, fair and satisfactory by 38, 32 and 24 % of the respondents. Electricity supply was bad as rated by 70% of the respondents while 94% indicated that cleaning of the abattoir was done regularly after slaughtering or usage of the abattoir.
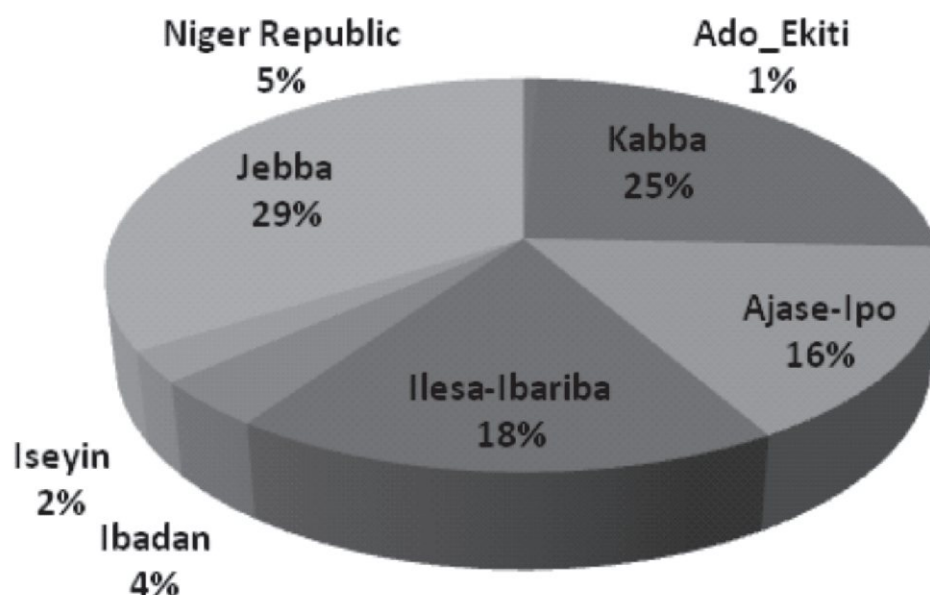
Fig. 1: Sources of supply of animals slaughtered in the abattoir

There were 8 sources of cattle supply to the abattoir (Fig. 1): Kabba, Ajase-Ipo, Ilesa-Ibariba, Ibadan, Jebba, Iseyin, and Ado-Ekiti. Merchants also trade cattle from Niger Republic to marketers. Some of these towns/villages are the neighbours to Ekiti State while Niger Republic is across the northern border to Nigeria. Fig. 1 shows that 25% of cattle slaughtered in the abattoir came from Kabba, 17.9% from Ilesa-Ibariba, 5.13% from Niger Republic and 0.64% from Ado-Ekiti. Fig. 2 shows that the highest breed of cattle slaughtered was White Fulani (41.3%) followed by SokotoGudali (30.3%), Red Bororo (23.9%), Keteku (2.75%) and Uda (1.83%).
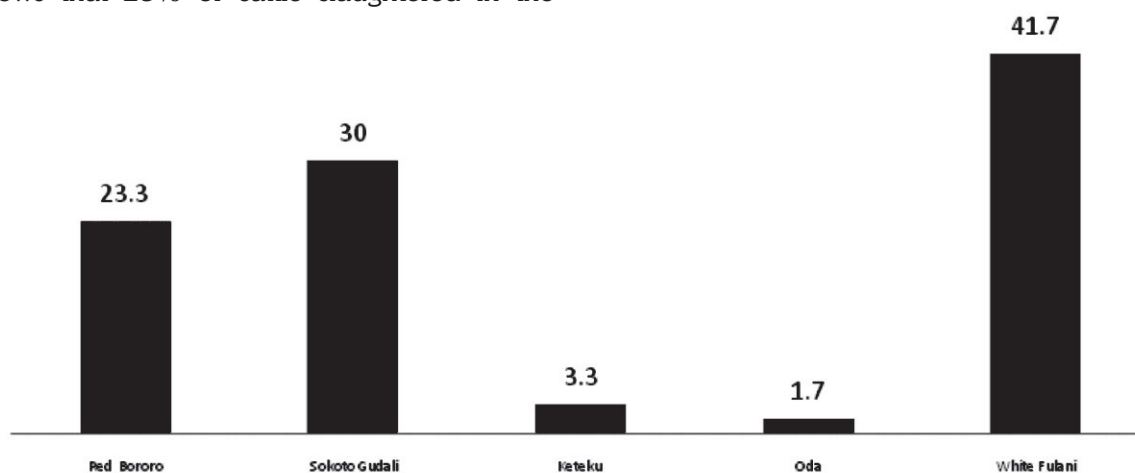

Fig. 2 Estimate of percentage of breeds of cattle slaughtered in the abattoir

The modes of transportation of the cattle to the abattoir and the carcass/cut parts/meat to the retail market are shown in Table 3. Most of the respondents (96%) used trucks/lorries to transport animals while 2% used taxi or car boots and 2% moved them on hoof. None of the respondents used the recommended cooling van to transport the carcass/cut parts/meat to the retail market or shops. Most of the respondents (72%) moved carcass/cut parts/meat by taxis/pick-up van/private vehicles of the butchers; 20% used motorcycles while others carried meat on bicycles or on the head to nearby retail outlets

Table 3: Mode of Transportation of cattle to and meat from the abattoir

Mode of Transportation	Frequency	Percentage	Ranking
Live animals			
Hoof	1	2	2
Lorry	48	96	1
Car/taxi boot	1	2	2
Carcass and Cut part/meat			
Cooling van	0		
Motor cycle (Okada)	10	18.52	2
Pick up van/private car	18	33.33	1
Taxi	18	33.33	1
Others (Bicycles/foot)	8	14.81	3

Table 4: Average costs of slaughtered cattle and cut part/meat per kg (₦)

Range of cost	Frequency	Percentage	Ranking
51,000 – 90, 000	15	30	2
91, 000 – 130,000	26	52	1
131,000 – 170,000	9	18	3
Price of meat kg^{-1}			
1000	10	20	2
1100 - 1200	38	76	1
1200	2	4	3

Table 5: Types of diseases found in the animals slaughtered and schedule of meat inspection

Name of disease	Frequency	Percentage	Ranking
Fascioliasis	24	48	1
Cysticercosis	0	0	
BSE	0	0	
TB	21	42	2
FMD	4	8	3
CBPP	0		
Meat inspection			
Ante- mortem			
Yes	43	86	1
No	7	14	2
Post –mortem			
Yes	46	92	1
No	4	8	2

Table 4 shows the average purchase price from the cattle market as ₦51,000-90,000, ₦91,000-130,000 and above ₦130,000 indicated by 30, 52 and 18% of the respondents respectively. Meat was retailed at ₦1,100-1,200 per kilogram (kg) by 76% of the respondents, below ₦1,200 per kg by 20% and above ₦1,200 per kg by 4%.

The diseases encountered in the abattoir are shown in Table 5. Fascioliasis was reported as the most prevalent by 48% of the respondents followed by Tuberculosis (42%) and Foot-and-mouth disease (8%). The professionals carried out ante-mortem and post-mortem inspections as indicated by 86% and 92% of the respondents respectively

Discussion

Ado-Ekiti is a fast growing state capital that has the prospect of becoming a metropolis attracting investors which would require the upgrade of infrastructural facilities to meet the rising food needs of the population. The dominance of males in the abattoir business is expected because it involves a lot of physical strength input that ranges from tethering of animals, walking it, slaughtering and the butchering processes. Therefore, strong men usually in their youth have the physique that supports or meets the energy demands of the local and traditional procedures. Salifu and Teye (2006), Adzitey (2011) and Ntanga (2013) had noted that young and middle-aged men of 30-50 years are solely involved in the marketing and slaughtering/butchering business. Thus, the finding of the involvement of 6% of the respondents being above 60 years of age agrees with the report of Adzitey*et al*. (2011). Most of the respondents were married with the men often supported by their wives in the cleaning of offal, roasting or skinning for processing the soft coat ('ponmo;) and cow legs ('bokoto'). The abattoir business appeared less attractive to the singles or widow and the few met were probably the wives of deceased merchants or butchers. Information gathered indicated that some butchers inherited the trade or craft as family business which was probably responsible for the trend observed in the educational status. With 80% educated beyond the primary school education, the literacy level of the respondents is high probably because the parents took advantage of the education policy in the state. This availed the children a minimum of senior secondary school education before becoming part of the family business or taking over completely from their fathers perhaps for lack of employment opportunities. However, none of the respondents had formal professional training which constitutes an area of critical need (FAO, 2007; Bhandare*et al*., 2009)

The butchers formed 72% of respondents because it is the most commercialized downstream sector of the abattoir business in Nigeria. The slaughtering capacity of about 60 cattle per week in the abattoir explains the lack of cattle merchants but only one (1) marketer. Information has it that most of the butchers doubled as marketers or merchants by forming small groups to purchase cattle for slaughtering on ad hoc basis and on mutual trust. The number of livestock officers and veterinary surgeons was adequate but seriously incapacitated and limited in carrying out major professional and management functions largely due to inadequate facilities and bureaucracy. Revenue collection by the state appointed consultant's representative affected the daily routine management of the abattoir towards the achievement of the standard operation procedure (SoP) as outlined in steps for meat processing in the document of Codex Alimentarius (1990). Abattoir control and management are the constitutional responsibilities of the LGA but the calsh of interest in revenue generion has them to tap the resources efficiently. The cleaners and security hired by the butchers gave functional maintenance of the environment rather than when government workers were involved which paid off and ensured more hygienic and clean work place.

The infrastructural facilities available include the lairage and slaughter hall/slab but which were adjudged fair in functionality. The lairage has not used for the purpose for which it was built (as at the time of this study) while other inadequacies include poor fencing and bad floor construction. This could be due to the number of animals for slaughtering which averages just 60 per week. The consequence is that the animals were not fully rested from transportation and without ante-mortem examination within the short time, diseases like Tuberculosis and Fascioliasis will be missed thereby leading to foetal wastages and public health hazard whose treatment, eradication and control would be at huge cost to government (Ogwuegbu*et al*., 1987; Oyekunle*et al*., 1992; Abdulkadir, 2008). The slaughter hall floor is poorly constructed with inadequate drainage system, poor visibility due to lack of electricity. The cold room, condemned meat rooms, rail system and hanger were rated as bad and non-existing because of their dilapidated conditions. The non-functional cold room means that there is no facility for cold storage of leftover meat and would suggest the possibility of a high incidence of harmful bacteria contamination and poor shelf life of meat products (Lawan*et al*., 2013; Adzitey*et al*., 2014; Fearon*et al*., 2014). The drainage system

was fair in functionality but obviously would require improvement. The open drainage system was used with run-offs into a sewage tank located 50 meters from the slaughter hall. Water supply system was not reticulated in the premises so that buckets were used to fetch water. Since there was no electricity, generators are occasionally used to pump water from the bore hole to the overhead tank. The poor nature of the infrastructural facilities agrees with the reports of other researchers in the different geopolitical zones of Nigeria (Frimpong*et al.*, 2012; Lawan*et al.*, 2013; Akpabio*et al.*, 2015).

The animals are purchased mostly from Jebba, Kabba, Ilesa-Ibariba and Ajase-Ipo in Kwara State at distances of 50 to 250 kilometres to Ado-Ekiti using truck/lorry transportation in journeys that take at least 8 hours considering the poor conditions of the roads and extortion by unscrupulous law enforcement and revenue mobilization agents. This is contrary to the welfare policy for the animal for slaughtering which should not be transported for more than 8 hours (Gebresenbet*et al.*, 2011). The animals are cruelly tied in groups of 5-7 for transport during which they undergo a lot of stress before arrival at to the destination. This has consequences on the quality of meat and non-ambulatory animals though the incidence was not recorded during the study because most of the animals were slaughtered within 24 hours of arrival. The carcass/cut parts were not transported in standard cooling vans but rather in sacks or openly in the booths of cabs or private vehicles, motorcycles and bicycles. These transport modes predispose the meat to contamination such that the quality is compromised as indicated by Fearon*et al.* (2014) in Ghana. There is need for the enactment and enforcement of laws that stipulate or guide transportation of carcass in hygienic manner in Ekiti State, as done recently in Lagos State of Nigeria. The breeds commonly purchased for slaughtering were in the order: White Fulani > SokotoGudali > Red Bororo. The choice of White Fulani was informed by its being the commonest breed in the cattle markets.

The purchase price of live cattle was mainly between ₦91,000 and ₦130,000 while the cost of the carcass cut part was between ₦1,100 and ₦1,200 per kg. These show the level of variation and instability in the retail prices which depend on changes in the purchase prices in the cattle markets.

Conclusion

Abattoir standards and management require serious attention in Ekiti State to ensure provision of up-to-date facilities needed in the handling of animals for slaughtering to avert health hazards. There is need for formal professional training of the stakeholders in animal handling, slaughtering and meat processing. In addition, the necessary papers that will accelerate the enactment of relevant laws and development of policy frameworks which address animal welfare for provision of good quality meat through this vibrant downstream sector (meat business) must be put in place

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