

## An Assessment of Cattle Welfare and Ethical Practices In Akinyele Abattoir, Ibadan

<sup>1</sup>Alimi, A. A., <sup>2</sup>Babayemi, O. J., <sup>3</sup>Komolafe, P. L. and <sup>4</sup>Abu, M. H.

<sup>1</sup>Department of Agricultural Technology, School of Agricultural Technology, Kogi State Polytechnic, Kogi State, Nigeria

<sup>2</sup>Department of Animal Science, Faculty of Agriculture, University of Ibadan, Oyo State, Nigeria

<sup>3</sup>Department of Agricultural Science and Technology, Bamidele Olumilua University of Education Science and Technology, Ikere-Ekiti, Ekiti State, Nigeria



<sup>4</sup>Department of Animal Production Technology, School of Agriculture and Agricultural Technology, Federal University of Technology, Minna, Niger State, Nigeria

Corresponding Author: [matt4msp@gmail.com](mailto:matt4msp@gmail.com)

### Abstract

Cattle welfare and ethics in cattle production cannot be separated from sustainability and quality. Welfare practice improves not only cattle health and productivity but also food safety and its quality, issues that recently take a front seat in the concerns of consumers and regulators. Ethical treatment of cattle has resonated more generally with societal values, including animal rights concerns, and goes toward a positive public perception of the industry. A study was conducted to assess the welfare and ethical practices of cattle at Akinyele Abattoir, Ibadan, Nigeria. The study lasted three weeks and data on breed of animal, sex, size, means of transporting the cattle to the abattoir, skin condition of the cattle, body conformation upon arrival, restraining method, time of slaughter, time of processing and type of processing method used were recorded. Data were subjected to descriptive tools of SPSS using frequencies, percentages and chi square. Results from the study showed that Fridays had the largest percentage of cattle slaughtered (31.2%), while Sundays had the least (5%). There were significant differences ( $P < 0.05$ ) in breeds of cattle slaughtered. The white Fulani breed had the highest percentage (47.9%) while the Kuri breed (1.6%) was the least frequently slaughtered breed. With regards to size, yearlings were the most frequently slaughtered cattle at the abattoir (38.4%) while calves were the least slaughtered cattle at the abattoir (25.2%). Most of the cattle (76.6%) were brought to the abattoir alive while 23.4% of the cattle were brought in already slaughtered. About 82.3% of the cattle slaughtered within the study period were wheeled to the abattoir while 17.7% were transported by foot. Cattle without skin disease were the most frequently slaughtered (96.9%), while only 3.1% were observed to have skin disease. Also, significant differences ( $P < 0.05$ ) were observed in time of slaughter, as most animals were slaughtered between the hours of 7.00 am and 9.59 am. In conclusion, the study identified significant inadequacies in Nigerian abattoirs, including outdated infrastructure and lack of modern meat preservation facilities. It also highlighted poor animal handling practices and the absence of comprehensive daily records on slaughtered animals. These issues undermine the efficiency and safety of meat processing in local abattoirs.

**Keywords:** ethical practices, cattle welfare, abattoir, slaughtering, cattle breeds



### Évaluation du Bien-être des bovins et des Pratiques Éthiques dans l'Abattoir d'Akinyele, Ibadan

#### Résumé

Le bien-être des bovins et les pratiques éthiques dans la production bovine ne peuvent être dissociés de la durabilité et de la qualité. Les pratiques de bien-être améliorent non seulement la santé et la productivité des bovins, mais aussi la sécurité alimentaire et sa qualité, des questions qui sont récemment devenues une priorité pour les consommateurs et les régulateurs. Le traitement éthique des bovins résonne également

avec les valeurs sociétales, y compris les préoccupations concernant les droits des animaux, et contribue à une perception publique positive de l'industrie. Une étude a été réalisée pour évaluer le bien-être et les pratiques éthiques des bovins à l'abattoir d'Akinyele, Ibadan, Nigéria. L'étude a duré trois semaines et les données sur la race des animaux, le sexe, la taille, le moyen de transport des bovins vers l'abattoir, l'état de la peau des bovins, la conformation corporelle à l'arrivée, la méthode de contention, le moment de l'abattage, le temps de traitement et le type de méthode de traitement utilisée ont été enregistrées. Les données ont été soumises aux outils descriptifs de SPSS en utilisant les fréquences, les pourcentages et le chi carré. Les résultats de l'étude ont montré que les vendredis avaient le pourcentage le plus élevé de bovins abattus (31,2 %), tandis que les dimanches avaient le plus bas (5 %). Il y avait des différences significatives ( $P < 0,05$ ) dans les races de bovins abattus. La race White Fulani avait le pourcentage le plus élevé (47,9 %), tandis que la race Kuri (1,6 %) était la race abattue le moins fréquemment. En ce qui concerne la taille, les jeunes bovins étaient les plus fréquemment abattus à l'abattoir (38,4 %), tandis que les veaux étaient les moins abattus à l'abattoir (25,2 %). La plupart des bovins (76,6 %) étaient amenés à l'abattoir vivants, tandis que 23,4 % des bovins étaient déjà abattus à leur arrivée. Environ 82,3 % des bovins abattus pendant la période de l'étude étaient amenés à l'abattoir sur des chariots, tandis que 17,7 % étaient transportés à pied. Les bovins sans maladie de peau étaient les plus fréquemment abattus (96,9 %), tandis que seulement 3,1 % étaient atteints de maladies de la peau. De plus, des différences significatives ( $P < 0,05$ ) ont été observées dans le temps d'abattage, la plupart des animaux étant abattus entre 7h00 et 9h59. En conclusion, l'étude a identifié des lacunes significatives dans les abattoirs nigériens, y compris une infrastructure obsolète et un manque d'installations modernes de conservation de la viande. Elle a également mis en évidence de mauvaises pratiques de manipulation des animaux et l'absence de dossiers quotidiens complets sur les animaux abattus. Ces problèmes compromettent l'efficacité et la sécurité du traitement de la viande dans les abattoirs locaux.

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**Mots-clés :** pratiques éthiques, bien-être des bovins, abattoir, abattage, races de bovins

## **Introduction**

### ***Ethical Dilemmas in Nigerian Abattoirs: Addressing Pre-Slaughter Animal Welfare to Improve Meat Quality and Public Health***

It has become a common practice by many abattoir workers to handle animals marked for slaughter with little or no human feelings (Adzitey and Huda, 2012). These animals are usually regarded as “doomed for death” hence, there is no obligation to handle such animal with care. In some cases, the animals are beaten, kicked, dragged by the horn, pulled by the tail and subjected to all kinds of inhumane treatments prior to slaughter. Such cruelty leads to stress and subsequently, a rise in the animal's body glucose level (Baumgard and Rhoads, 2023). This results in the production of poor quality meat. Concerns about the welfare of these animals and how they are handled prior to slaughter is therefore

increasing, as the meat obtained from such animals end up on the table of many Nigerians. An abattoir is a special facility designed and licensed for receiving, holding, slaughtering and inspecting meat animals and meat products before release to the public (Alonge, 2005). Abattoirs, slaughter houses and slabs therefore, are the key-points where the operators could have control over the conversion of animals to meat so as to ensure proper hygiene and quality. Article 7 of the Federation of Veterinarians of Europe stipulated that all abattoir operatives must ensure that stress during the slaughter process should be kept to a minimum and where possible, distress and pain eliminated (FVE Slaughter Directives, 2021). To achieve this, animals should be stunned effectively before slaughter with a method causing immediate unconsciousness, preferably death. In addition, all operatives involved with

stunning, slaughter and general animal handling prior to slaughter and during processing must be properly trained, their skills and knowledge examined, in particular in the field of welfare, and the person should be certified as competent by the official veterinarian. Humane transport, handling, and slaughter practices and the introduction of modern systems and equipment in the slaughter process will not only decrease animal suffering, but also provide economic benefits for the human population, as the amount of meat and hide wasted is reduced. At the same time, workers and meat safety is greatly increased. Unlike in developing countries, these are easily achieved in developed countries.

Cattle command a prominent position in meat supply and livestock industry in Nigeria. Estimates by Umar (2007), Umar *et al.* (2008), Tibi and Aphunu (2010) puts cattle population in Nigeria at an estimate of 15.3 million. Popular breeds found in abattoirs include White Fulani, Red bororo, Sokoto Gudali, Adamawa Gudali and Kuri. In the past, some studies have made notable contributions to animal welfare and meat science in general: pre-slaughter stress responsiveness (Terlouw *et al.*, 2008; Muchenje *et al.*, 2009); abattoir and slaughter surveillance (Addasset *al.*, 2010). Currently, however, there is insufficient information on animal handling and related animal welfare problems that can be used as basis to develop animal welfare policies in Nigeria. Cases of slaughtering sick and unhealthy animals, delayed processing after slaughter and the poor handling of meat during processing by the abattoir operatives have received little attention. This research therefore, is geared towards identifying the loopholes in the welfare of animals marked for slaughter and ethical practices by abattoir workers, with the aim of preferring a suitable and sustainable recommendation for improvement.

## **Materials and Methods**

### ***Experimental Site***

The study was carried out at the International Cattle, Sheep and Goat Market, Akinyele, situated about 19 kilometers north on the Ibadan – Oyo road. The market currently serves the main Kraal for initial receipt of cattle from the northern states and major distributor to south-western states. The abattoir is situated close to the entrance of the cattle market and also serves as service centre for the kraal.

### ***Duration of the research work***

The research work lasted three weeks (Monday-Sunday) and data was collected daily from the hours of 7:00 am to 7:00 pm.

### ***Data Collection***

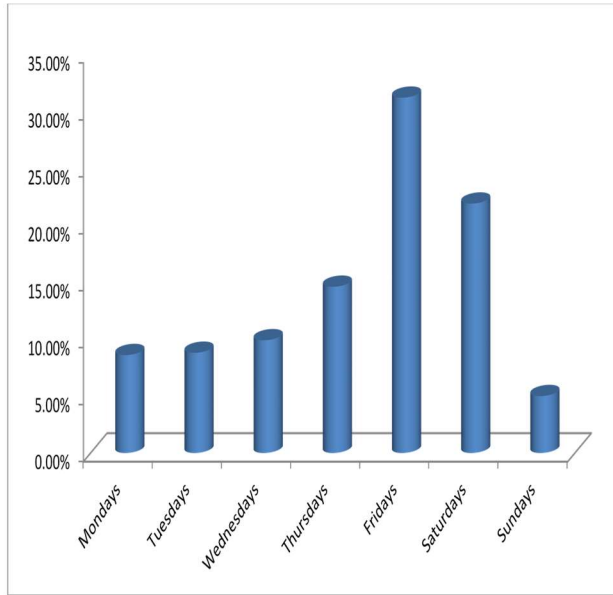
Data were obtained using direct observation with the aid of a checklist. For better planning of the research work and proper design of codes for data collection, preceding exploratory visits and interviews with key people at the abattoir was made. Data obtained from each cattle presented for slaughter include: arrival time, breed of animal, sex, size, means of transporting the cattle to the abattoir, skin condition of the cattle, body conformation upon arrival, retraining method, the slaughter method employed (piercing or open), time of slaughter, time of processing and type of processing method employed (singing/scalding). Species and breeds identifications were done based on phenotypic/external characteristics (Blench, 1999).

### ***Data analysis***

Data collected was entered into the Microsoft® Office Excel Windows 2007 spreadsheet. Missing values were identified and corrected. Further analysis was done using the statistical package IBM® SPSS® statistical version 21. Significant treatment means were separated and the percentage frequencies were derived, using Pearson Chi-Square Test. Necessary cross-tabulations was conducted to test the significance of the associations between the observed parameters.

**Results**

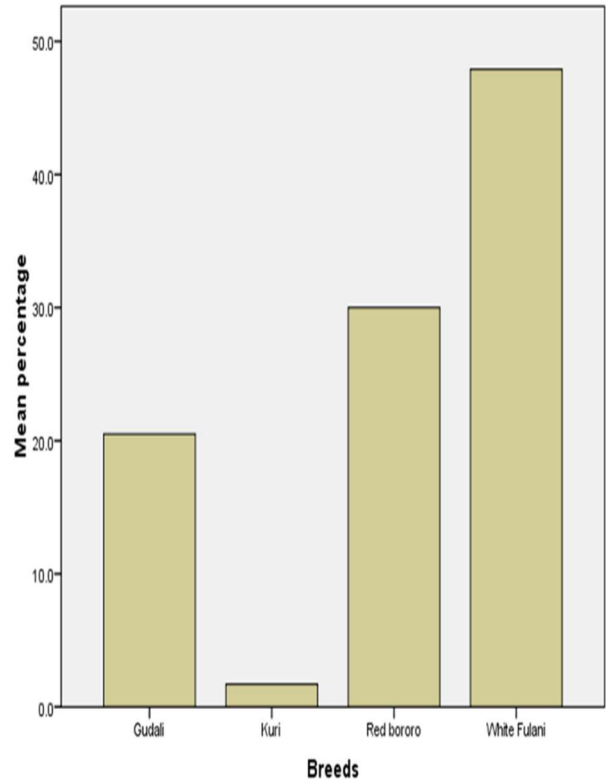
Figure 1 shows the percentage of cattle brought for slaughtering at Akinyele abattoir during the period of the study. Fridays were observed to have the largest percentage of cattle slaughtered (31.2%), while Sundays had the least (5%). The other days of slaughter according to the observed frequency of slaughter includes: Saturdays, Thursdays, Wednesdays, Tuesdays and Mondays at 21.9, 14.6, 9.9, 8.8 and 8.6%, respectively.



**Figure 1: Showing the days and distribution of cattle slaughtered at Akinyele abattoir, Ibadan during the period of the study**

Source: Field Survey, 2018

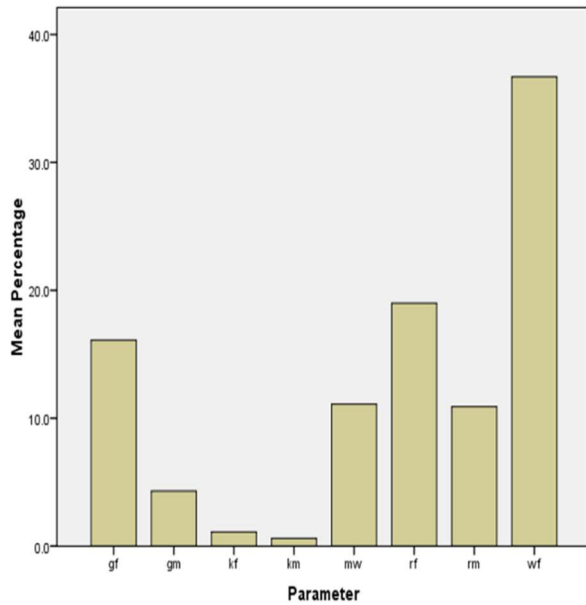
Figure 2 shows the distribution of breeds of cattle brought for slaughter at the abattoir. Breed variability was evident on frequency of cattle slaughtered, with white Fulani having the highest percentage (47.9%). This is followed by Red bororo (30.0%) and Gudali (20.5%), while the least slaughtered was Kuri breed (1.6%).



**Figure 2: Showing the distribution of breeds of cattle brought for slaughter at Akinyele Abattoir, Ibadan**

Source: Field Survey, 2018

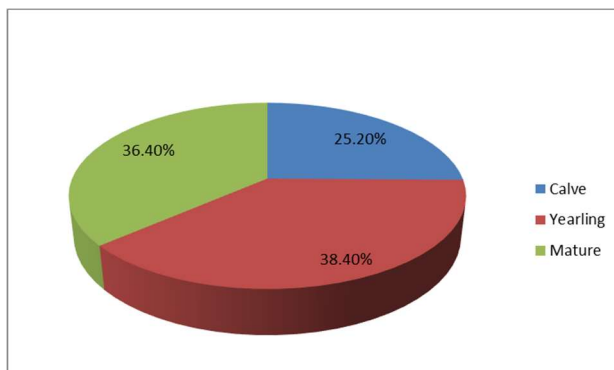
Figure 3 shows the frequency and percentage of sex and breed of cattle brought to the abattoir for slaughter and processing. This result revealed cows as the most slaughtered at the abattoir, with WF recording the highest percentage (36.7%), followed by RF (19.0%), GF (16.0%), w and KF (1.1%). The MW was observed as the most frequently slaughtered bull (11.1%), and closely followed by RM (10.9%). Percentage of GM slaughtered was 4.3%, while KF recorded the least percentage of slaughter at just 0.6%.



**Key:**gf = Gudali Female, gm= Gudali Male, kf= Kuri Female, km= Kuri Male, mw= White Male, wf= White Female, rf= Red Female, rm= Red Male

**Figure 3: Showing the frequency and percentage of sex and breed of cattle brought for slaughter at Akinyele Abattoir, Ibadan**  
Source: Field Survey, 2018

Presented in figure 4 are the sizes of cattle slaughtered at Akinyele abattoir during the period of the study. Yearlings were observed as the most frequently slaughtered cattle at the abattoir (38.4%), closely followed by mature cattle (36.4%). Calves were observed to be the least slaughtered cattle at the abattoir (25.2%).

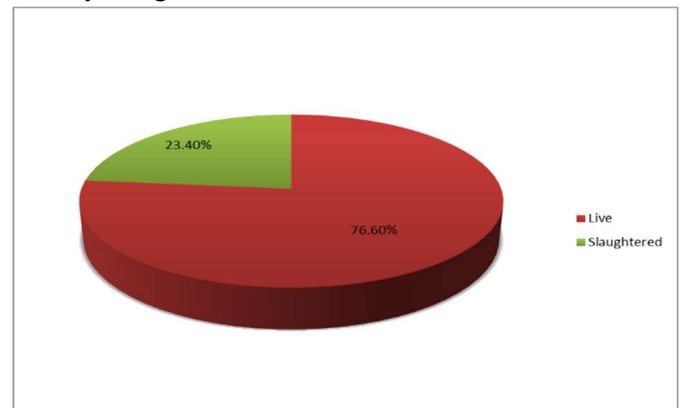


**Figure 4: Showing the percentage of the sizes of cattle slaughtered at Akinyele abattoir**

Source: Field Survey, 2018

Correct on figure 4-- calve should be calves; yearling should be yearlings

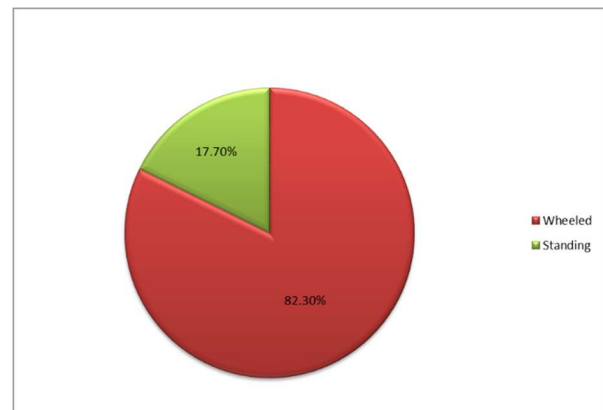
Figure 5 shows the percentage of live and slaughtered cattle that were brought to the abattoir for slaughter. Live cattle were observed to be 76.6%, while 23.4% of the cattle were already slaughtered.



**Figure 5: Showing the percentage of live and slaughtered cattle brought to Akinyele abattoir for processing**

Source: Field Survey, 2018

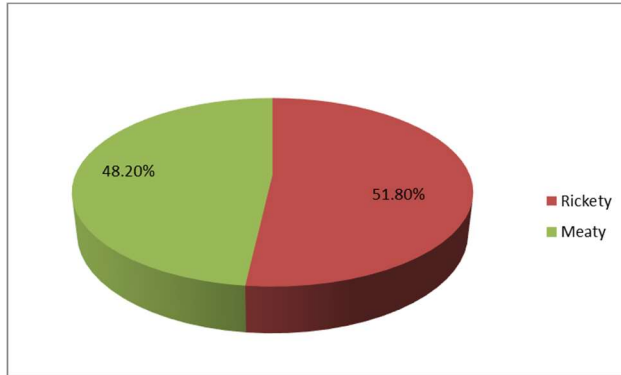
Figure 6 shows the percentage of wheeled and standing cattle brought to the abattoir for slaughter. The frequency and percentage of wheeled cattle (82.3%) was observed, while 17.7% was recorded for standing.



**Figure 6: Showing the percentage of rickety and meaty cattle brought to the abattoir for slaughter**

Source: Field Survey, 2018

Figure 7 shows the percentage of rickety and meaty cattle brought to the abattoir for slaughter. Rickety cattle were the most frequently slaughtered (51.8%), while the percentage for meaty cattle was 48.2%.



**Figure 7: Showing the percentage of rickety and meaty cattle brought to the abattoir for slaughter**

Source: Field Survey, 2018

Table 1 shows the pre and post slaughter parameters observed on cattle brought for slaughter at the abattoir. Result obtained revealed that cattle without skin diseases were the most frequently slaughtered (96.9%), while only 3.1% was observed to have skin diseases. For the restraining method, only 12.8% of the animals brought for slaughter were tethered, while those that were not tethered had the highest percentage (87.2%). The most observed method of slaughter was the open method (92.5%), while 7.5% of the cattle were slaughtered using the piercing method. Singeing was observed as the most frequently employed method of processing at the abattoir, with about (88.4%) of carcass processing done by setting the carcass on fire (singeing), while 11.6% were processed by scalding.

**Table 1: Pre and post slaughter parameters measured on arrival of animals at the abattoir**

Parameters	Types	Frequency	Percentage (%)
<b>Skin condition at arrival</b>	Diseased	28	3.1
	Non Diseased	870	96.9
<b>Restrain Method</b>	Tethered	115	12.8
	Not tethered	783	87.2
<b>Slaughter Method</b>	Pierced	67	7.5
	Open	831	92.5
<b>Processing Method</b>	Singed	794	88.4
	Scalded	104	11.6

Table 2 shows the time of arrival and frequency of cattle brought for slaughter at Akinyele abattoir according to sex and breed. The population of white Fulani cow is significantly ( $P < 0.05$ ) highest among the entire breed observed. White Fulani cow (117, 104 33 and 16) had the highest number of frequency at the abattoir across all time range, followed by Red bororo cow (86, 56, 19 and 10 respectively). Kuri had the least frequent value. Similar ( $P < 0.05$ ) was recorded for the bulls. Similar significant ( $P < 0.05$ ) values was recorded for the bulls, with white Fulani being the most frequent. Significant ( $P < 0.05$ ) breed differences was observed in the frequency of cattle brought for slaughter at the abattoir, with white Fulani breed being the most frequently slaughtered, followed by the Red bororo. Kuri breed was observed as the least frequent. Based on time of arrival, significant difference ( $P < 0.05$ ) was recorded across all time range. The hours of 7:00am-9:59am was observed to have the highest number of animals slaughtered. This is followed by 10:00am-12:59pm, with the least number of slaughter activities taking place between the time ranges of 4:00pm-7:00pm.

**Table 2:** Arrival time and frequency of cattle brought for slaughter at Akinyele abattoir according to sex and breed

Sex	Breed	Time of arrival				Pearson Chi-Square Value
		7:00am - 9:59am	10:00am - 12:59pm	1:00pm - 3:59pm	4:00pm - 7:00pm	
Cow	Gudali	73	49	15	8	0.048*
	White Fulani	117	104	33	16	
	Red bororo	86	56	19	10	
	Kuri	6	0	1	3	
Bull	Gudali	18	14	6	1	
	White Fulani	36	48	12	4	
	Red bororo	44	36	12	6	
	Kuri	4	0	1	0	

Table 3 shows the frequency and interaction between time, pre and post slaughter inspection of cattle brought for slaughter at different intervals. There were no significant ( $P>0.05$ ) effect of size on calves, yearling and mature cattle at the different time intervals. There is however, a numerical difference among them. Highest similar values were obtained for yearling (175) and Mature (166), between the hours of 7:00am-9:59am, while least values were recorded for calves across all time range. Highly significant ( $P<0.01$ ) arrival status on live and slaughtered animals was prominent, showing highest (305) and (264) effect on live cattle compared with (139) and (42) slaughtered cattle, between time intervals of 7:00am-9:59am and 10:00am-12:59pm respectively.

No significant ( $P>0.05$ ) effect in the arrival posture of wheeled and standing animals at different time intervals. There was, however, a numerical difference in the frequency, with wheeled cattle having the highest value (368) and (241), compared with standing cattle (76) and (66) at 7:00am-9:59am and 10:00am-12:59pm time intervals.

Significant ( $P<0.05$ ) of body conformation was evident in rickety and meaty animals observed at different time intervals. Rickety cattle had the highest frequency (254) between the hours of 7:00am-9:59am. Least significant frequency was,

however, recorded between the hours of 4:00pm-7:00pm.

There was no significant difference ( $P>0.05$ ) in the skin condition of diseased and not diseased animals at different time intervals. There is however a numerical difference across all time interval. Highest frequency observed was for animals without diseased skin (431) between the hours of 7:00am-9:59am.

No significant difference ( $P>0.05$ ) was observed between restrain methods employed for animals that underwent restrain and no restrain at different time intervals. Highest frequency of animals without restrain was observed between 7:00am-9:59am. Similarly, restrained animals were highest at 7:00am-9:59am, followed by 10:00am-12:59pm. Least frequent value for both restrained and unrestrained animals was observed between 4:00pm-7:00pm.

There was no significant ( $P>0.05$ ) effect between processing methods employed for singed and scalded carcass. Numerical difference was observed, however across all time intervals, with 7:00am-9:59am having the highest difference. The hours of 4:00pm-7:00pm had the least frequency of singed and scalded carcass.

## Discussion

Highest frequency of slaughter per days as observed in this study revealed Fridays and

Saturdays as the busiest days, with the greater percentage of the slaughter taking place on Fridays. This can be related to the fact that numerous activities and ceremonies usually take place over the weekend, hence the high demand for beef and more animals to be slaughtered. Sunday was observed to have the lowest percentage of slaughter. This is a day that has been set aside by the abattoir managers to serve as a day for rest. No commercial sale of beef is allowed at the abattoir on this day and the few slaughtering that occur are mostly for ceremonies and personal consumption. The time effect on the frequency of slaughter at the abattoir (Table 3) also revealed the morning hours as the busiest part of the day. This implies that due to the

unavailability of cold rooms and storage facilities at the abattoir, meat merchants prefer to do their business in the early hours while their meat is still fresh and attractive to potential consumers.

The higher percentage of yearlings slaughtered at the abattoir implies that animals were slaughtered at the abattoir without minding their age. This might be due to fact that cattle farmers sometimes are forced to sell out their stock regardless of their age or status (pregnant and otherwise), during the time of the year when there was inadequate feed for their large herds. This is done to attract more money to feed the rest of the animals. This position agrees with the report of Lamidi and Ologbose(2014)who stated that due to heavy demand of livestock for available forage and the

**Table 3: The relationship between time of arrival and several pre and post slaughter parameters**

Time		7:00 am- 9:59 am	10:00 am- 12:59 pm	1:00 pm- 3:59 pm	4:00 pm- 7:00 pm	Pearson Square	Chi- Value
<b>Size</b>	Calves	103	85	25	13	0.07	
	Yearlings	175	114	41	15		
	Mature	166	108	33	20		
<b>Arrival Status</b>	Live	305	264	84	34	0.00**	
	Slaughtered	139	42	15	14		
<b>Arrival Posture</b>	Wheeled	368	241	87	43	0.07	
	Standing	76	66	12	5		
<b>Body Conformation</b>	Rickety	254	141	49	21	0.01*	
	Meaty	190	166	50	27		
<b>Skin Condition</b>	Diseased	13	13	1	1	0.40	
	Not Diseased	431	294	98	47		
<b>Restrain Method</b>	Tethered	63	41	10	1	0.09	
	Not tethered	381	266	89	47		
<b>Processing Method</b>	Singed	394	278	84	38	0.84	
	Scalded	50	29	15	10		

competition between animals for available forage during dry season, farmers may be forced to sell out some of the animals in their herd. As a result of this desperation, they may sell the animals at a loss in order to reduce the rate of competition and demand of animals on available forage. Result of the research revealed no significant effect on the interaction between time and size, on frequency of cattle marked for slaughter at the abattoir. This report revealed that animals of different sizes were generally slaughtered at the abattoir, regardless of the time.

As expected, a higher percentage frequency of live animals brought to the abattoir was observed. This might be as a result of consumer preference for freshly slaughtered meat. A similar field survey carried out in Sokoto metropolis by Yakubu *et al.* (2006), suggest that consumers generally prefer fresh beef. However, a highly significant effect on the time and frequency of live and slaughtered animals brought to the abattoir at different intervals was observed (Table 3). This can be linked to the fact that animals usually undergo a lot of stress during transport which in many cases results to their death. This is an undesirable risk which cattle marketers more often than not, have to take. However, this situation can be avoided by taking adequate measures to ensure the welfare and safety of animals during transport to the abattoir. Animals marked for slaughter are frequently wheeled down to the abattoir as observed by the greater percentage recorded in the arrival status. The result suggests that slaughtered animals must have undergone a lot of stress before arriving at the abattoir hence, the higher frequency in the number of wheeled animals. This assumption is consistent with the report of Warriss (2000) that animals are exposed to all kinds of stresses ranging from; physical such as high ambient temperature, vibration and changes in acceleration, confinement, noise, and crowding; to psychological such as the breakdown of social

groupings and mixing with unfamiliar animals, unfamiliar or noxious smells and novel environment during transportation and pre-slaughter handling. The results obtained in this study (Table 3) revealed no significant effect of time in the arrival posture of wheeled and standing animals at different intervals. As observed, wheeled and standing animals were randomly brought to the abattoir at different intervals. Hence, no definite pattern was observed across all time intervals.

The higher percentage of rickety animals recorded in this research might be due to the higher population of emaciated animals at the cattle market. This could be as a result of the fact that cattle farmers are more willing to sell old and unproductive animals than the young, active ones. It should also be known that the survey was conducted during the late dry season (March – April), a period that is sometimes characterized by significant loss in body reserves of livestock due to low availability of feed resources. This leads to emaciation which is known to cause a major loss in economic value of an animal. Therefore, in order to cut their losses, cattle farmers are left with little choice but to sell at a cheaper rate to the meat merchants whose aim is to maximize profit. This assumption is further elucidated by the report of Addasset *al.* (2010) that farmers rarely sell their healthiest and best built animals, unless under severe circumstances and dire needs. An interaction between time and body conformation showed a significant effect on the frequency of rickety and meaty animals observed at different intervals (Table 3). Rickety cattle had the highest frequency between the early hours of the morning, which revealed the poor state of health in which the animals were in, probably as a result of transportation stress. Early slaughter of these animals is therefore seen as a way to avoid economic loss resulting from the death of the animals.

The interaction between the time and frequency of diseased or non-diseased animals brought to the abattoir at different intervals showed no significant effect (Table 3). This result suggests that there is no particular time of the day in which animals with diseased skin are slaughtered. Highest percentage variation in the frequency of cattle without skin disease (Table 1) suggests that the meat merchants have more preference for animals without skin disease, as a diseased animal looks less attractive to potential buyers.

The analysis revealed no significant interaction effect between time and restraining method, as presented in Table 3. This implies that the butchers do not see the restraint as an important practice in the slaughtering process at any given time of the day. However, highest percentage frequency of animals that were not tethered (Table 1) might be due to the absence of lairage at the abattoir. As observed, animals brought to the abattoir are usually slaughtered within minutes of arrival, leaving little or no room for tethering and pre-slaughter inspection. This practice goes against the recommendations of Tennessen and Morigan (1999) who had earlier reported that a major advantage of tethering and having a lairage in abattoirs is to enable physical appraisal of the body conformation of animals marked for slaughter. Furthermore, it also helps to reveal the efficiency of livestock handling and processing facilities. This aligns with the recommendations of Ikeme (1990), who advocated for the presence of qualified personnel, modern equipment, adequate lairage, a reliable potable water supply, proper drainage, and an efficient sanitation system in standard abattoirs. There was a significant effect on the interaction between time and the frequency of male and female cattle slaughtered (Table 2). Similar highest percentage was observed in the frequency of cows slaughtered at the abattoir (figure 3). This might be due to higher population and availability of the cows around the study area, rather than consumer preference, as most of the consumers

are not aware of the sex of the animal slaughtered. Consequently, animals that are predominant in the study area were most frequently slaughtered compared to those that were scarce to find. Similarly, time effect on breed at different intervals, showing white Fulani as the most frequently slaughtered breed (table 2 and figure 2) can be attributed to its general population as the most numerous and widespread breed in Nigeria (Babayemi *et al.* 2014).

The result of the research revealed no significant time effect on the processing method (singeing/scalded) employed at the abattoir. Highest percentage frequency recorded for singeing carcasses however suggests singeing as the most preferred processing method. This is similar to the report from Obiri-Danso *et al.* (2008) which revealed that in several African countries, roasting in an open fire is the major process by which hair on the skin of slaughtered goats and cattle is removed.

### **Conclusion**

The study identified significant inadequacies in Nigerian abattoirs, including outdated infrastructure and lack of modern meat preservation facilities. It also highlighted poor animal handling practices and the absence of comprehensive daily records on slaughtered animals. These issues undermine the efficiency and safety of meat processing in local abattoirs.

### **Recommendation**

Establishing better facilities and training on animal welfare and ethics for abattoirs can enable them to produce quality meat that is compliant with the set regulations. If integrated economically, ethically, and qualitatively, this has a potential way of increasing animal welfare even in conditions of infrastructural deficiencies. Critical to this is an emphasis on training and careful record-keeping at each stage of the processing chain if long-term improvement is to be brought about.

## Acknowledgement

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- Conflict of Interest**
- The authors declare that no conflict of interest was observed during this study
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