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A Retrospective Study on the Prevalence of Fracture in Animals Slaughtered at Jos Abattoir, Plateau State, Nigeria

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Abstract

Fracture is a common condition among livestock slaughtered in abattoirs across Nigeria. This study determined the prevalence of fracture in animals (cattle, goats and pigs) slaughtered at Jos abattoir within eleven years (2006-2016), and ascertained the difference in fracture prevalence between the species. Relevant data were obtained from the abattoir records, analyzed using Microsoft Excel and subjected to chi-square test using Graph-Pad Prism. Out of the 209,792 animals slaughtered, 2,835 (1.4%) had fractures. Annual prevalence varied between 2.4% (2007) and 0.6% (2010). Species prevalence was higher (3.4%) in pigs than goats (0.8%) and cattle (1.9%). There was significant difference ($P < 0.0001$) in fracture prevalence amongst the species. The high prevalence was attributed to poor animal welfare, including inhumane transportation and poor handling. It was therefore recommended that specially designed vehicles be used for conveying animals to abattoirs. Also, government should implement and enforce policies to regulate cruelty to animals.

Keywords: Abattoir, animal welfare, fracture, prevalence, slaughter

1. Introduction

There is an emerging social ethic regarding farm animal welfare [1]. The concern for animal welfare is now a major consideration in meat production based on the belief that animals can suffer [2]. The relationship between pre-slaughter stress and meat quality has been established in previous studies [3], in which it was found that stress impacts negatively on meat quality and that some of the changes meat undergoes after slaughter depend on the pre-slaughter handling of animals.

Fracture is a condition commonly encountered in farm animals slaughtered in abattoirs across Nigeria. Most of the fractures observed at ante-mortem inspection of animals usually occur during the transportation of animals from either farms or markets to abattoirs [4]. The jostling associated with road travel resulting from bad roads can lead to falls and bangs against the walls of trucks or crates which often cause wounds, internal hemorrhage and broken bones [5]. Birds caught and thrown quickly into transportation crates often suffer fracture and internal hemorrhages [6]. In addition, cows transported in pairs inside crates to abattoirs are prone to collapse than those in groups [7].

Abattoirs in developed countries operate in ways that ensure animal welfare and meat quality are sustained while in the developing countries, animal welfare and meat quality are not of uttermost priority [8]. There are reported cases of fracture in animals slaughtered at the Jos abattoir. The aim of this study is to determine the prevalence of fracture in animals slaughtered at the abattoir over a period of eleven years and to analyze the difference in fracture between the species slaughtered.

2. Materials and methods

2.1. Data Collection

Data on reported cases of fracture in cattle, goats and pigs at the Jos abattoir between 2006 and 2016 were obtained from the record files of animals slaughtered at the abattoir. The records of number of animals slaughtered were also retrieved.

The data collected for the respective years were analyzed to determine the prevalence and the difference in fracture between the species.

2.2. Data analysis

The data collected were analyzed using simple descriptive statistics such as percentages, and line graph of Microsoft Excel spreadsheet 2007. Data were further subjected to chi-square using graph pad prism for the establishment of significance.

3. Result

The total number of animals (cattle, goats and pigs) slaughtered during the 11 year period was 209,792 out of which 2,835 (1.4%) had fracture (Table 1). The annual prevalence of fracture for the three species was highest (2.4%) in 2007 and lowest (0.6%) in 2010. The overall specie prevalence of fracture during the study period was observed to be highest (3.4%) in pigs and lowest (0.8%) in goats (Table 2).

Table 1: The overall prevalence of fracture in cattle, goats and pigs for the 11 year period (2006 – 2016).

Species	Total No. of animals slaughtered	Total number of animals with fracture	Prevalence (%)
Cattle	82,422	1,591	1.9
Goats	120,253	1000	0.8
Pigs	7117	244	3.4
Total	209,792	2835	1.4

In cattle, annual fracture prevalence was highest (5.0%) in 2007 and lowest (0.5%) in 2013, while in goats, the highest (3.6%) annual prevalence was observed in 2014 and the lowest (0.4%) in 2010. In pigs, highest (7.4%) annual

prevalence was also observed in 2014 and the lowest (1.3%) prevalence in 2009 (Table 2).

The difference in the prevalence of fracture between species was statistically significant ($p < 0.0001$).

Table 2: Annual record of fracture in animals slaughtered at the Jos abattoir (2006-2016)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Fracture in Cattle	261	434	309	244	81	56	46	29	42	29	60	1,591
Number Slaughtered	12,872	8,657	9,441	11,025	10,140	4,931	5,153	6,302	5,558	3,913	4,430	82,422
Prevalence in Cattle (%)	2.0	5.0	3.3	2.2	0.8	1.1	0.9	0.5	0.8	0.7	1.4	1.9
Fracture in Goats	282	329	104	123	63	8	15	12	26	11	27	1,000
Number Slaughtered	25,793	24,702	24,676	22,572	17,483	905	882	964	729	543	1,004	120,253
Prevalence in Goats (%)	1.1	1.3	0.4	0.5	0.4	0.9	1.7	1.2	3.6	2	2.7	0.8
Fracture in Pigs	32	45	25	8	14	18	20	15	42	13	12	244
Number Slaughtered	777	767	647	634	612	603	605	674	569	374	855	7,117
Prevalence in Pigs (%)	4.1	5.9	3.9	1.3	2.3	3.0	3.3	2.2	7.4	3.5	1.4	3.4
Fracture in Cattle, Goats & Pigs	575	808	438	375	158	82	81	56	110	53	99	2,835
Number Slaughtered	39,442	34,126	34,764	34,231	28,235	6,439	6,640	7,940	6,856	4,830	6,289	209,792
Prevalence (%)	1.5	2.4	1.3	1.1	0.6	1.3	1.2	0.7	1.6	1.1	1.6	1.4

Source: Annual record of diseases and conditions in animals slaughtered at the Jos Abattoir

Generally, the annual prevalence of fracture throughout the study period was undulating across the species during the study period (Figure 1).

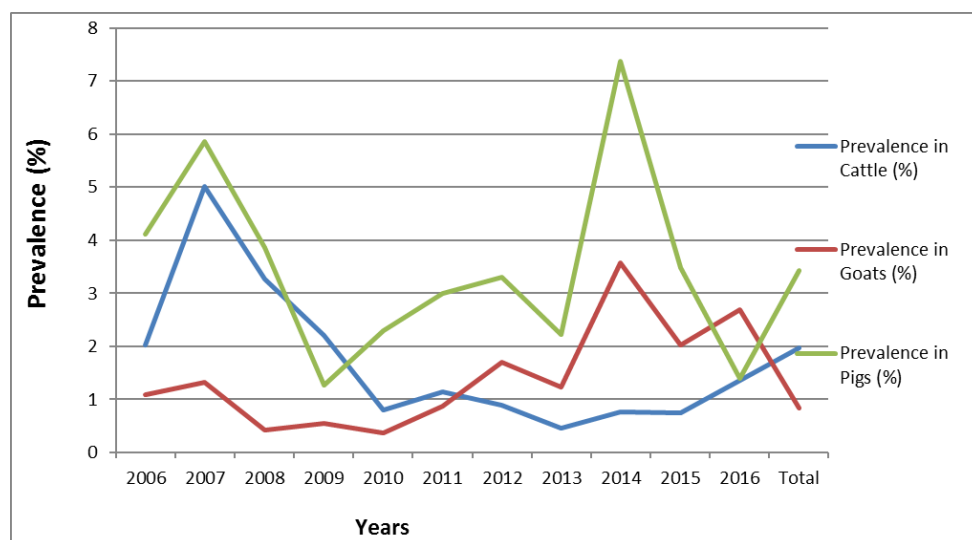


Fig 1: Prevalence of fracture in cattle, goats and pigs slaughtered at the Jos abattoir (2006-2016)

4. Discussion

Animals being transported to the abattoir for slaughter are prone to fractures due to many factors including poor pre-

slaughter handling procedures and the fact that vehicles not designed for animal transportation are utilized in the transportation of animals to the abattoir [9]. Such practices are

common in developing countries especially in Africa, Nigeria inclusive, as most of the abattoirs are poorly managed due to lack of resources.

The overall prevalence of fracture from this study was 1.4% which confirmed that fracture cases are prevalent and are part of the problems encountered at the Jos abattoir resulting in poor meat quality. Other cases of fracture in livestock at the abattoir have been reported^[10, 11]. However, it is pertinent to state here that there is dearth of information on the prevalence of fracture in abattoirs.

The annual prevalence of fracture for the three species was highest (2.4%) in 2007 and lowest (0.6%) in 2010. The high fracture prevalence could be attributed to poor management during boarding and animal handling at the point of loading and unloading prior to slaughter at the abattoir. The undulating annual percentages of fracture throughout the study period is in disagreement with the findings of Bueno *et al.*^[11] who reported a steady increase over the years.

The overall prevalence of fracture in cattle was 1.9%, and the annual prevalence varied between 5.0% in 2007 and 0.5% in 2013. The prevalence (3.3%) in 2008 was lower than the 6.5% reported by^[10] in a nine-month study at Zaria abattoir within the same year. The reason for the disparity was not clear, but could be as a result of the fact that the latter used a set of primary data, whereas the data reported in this study are secondary, which could have been influenced by poor data entry.

The overall prevalence for goats was 0.8%, and the annual prevalence varied between 3.6% in 2014 and 0.4% in 2008 and 2010. The relatively lower prevalence recorded in goats could be due to the hardiness, relative smaller body size and weight of goats, as reported by Jansen and Van den burg^[12].

In pigs, the overall prevalence was 3.4%, and the annual prevalence was highest in 2014 (7.4%), and lowest in 2009 (1.3%). On the average, the findings of this study showed lower prevalence compared to those of the three-year (2007-2009) study by Bueno *et al.*^[11] The latter reported 4.6% (2007), 14.8% (2008) and 26.7% (2009) whereas the findings of this study were 5.9%, 3.9%, and 1.3% for the respective years.

Comparatively, pigs accounted for much higher prevalence of fracture (3.4%) than cattle (1.9%) and goats (0.8%). Previous studies have shown that lack of skill team in animal handling prior to slaughter^[13, 14], bone loss which occurs in pigs reared solely on pasture^[15] and the usual physical activities associated with transportation to slaughter houses mounting pressure on the skeleton already weakened by nutritional osteoporosis^[15] contribute to the higher prevalence in the species.

5. Conclusion

Fracture is confirmed to be a common condition observed in animals for slaughter at the Jos abattoir. It is therefore recommended that vehicles designed for transporting livestock should be used in the transport of animals to the abattoir. Stockmen and other livestock handlers should be taught proper handling and restraint techniques in accordance with the European Union (EU) convention for the protection of animals during transportation.

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