



Evaluation of Disease Conditions Encountered at Slaughter in Ogbomoso Central Abattoir, Oyo State

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Authors' contributions

This work was carried out in collaboration between both authors. Author ECA designed the study, managed the literature searches, wrote the protocol and wrote the first draft of the manuscript. Author JEA performed the statistical analysis and managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Diseases in animals not only constitute health challenges in man but are also a major source of economic losses. Hence, the proper identification, understanding, management and documentation of diseases prevalent in animal husbandry would go a long way in controlling the dissemination of zoonotic diseases and reduce the financial implication on the economy as aimed by this survey. An abattoir survey to determine the prevalence of zoonotic diseases encountered amongst animals slaughtered was conducted between January, 2014 and December, 2016 at the Oja-tuntun slaughter slab in Ogbomoso town. Data retrieved was analyzed and results presented as tables and figures were appropriate. A total of thirteen thousand, one hundred and seventy-two (13,172) animals were examined and slaughtered from which 11,903 (90.4%) were bovine and 1,269 (9.6%) were caprine. The multi-year study indicated the following incident of abattoir identified diseases

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and conditions: pneumonia (22.8%), tuberculosis (25.3%) and fascioliasis (34.0%); pimply-gut (14.2%), pneumonia (29.7%) and fascioliasis (43.2%); pimply-gut (18.1%), tuberculosis (27.7%) and fascioliasis (28.4%) as the most prevalent diseases in the years 2014, 2015 and 2016 respectively. The survey also revealed a significant ($p < 0.05$) higher rate of occurrence of fascioliasis than the other diseases amongst animals slaughtered. In line with these findings, there is a need for the veterinary and public health officers in slaughterhouses to be more vigilant in the identification of diseased animals; prevention and control of zoonotic diseases as well as the need for the government to establish a well-defined compensation plan for the affected farmers.

Keywords: Zoonotic diseases; anti-mortem inspection; Ogbomoso; post-mortem inspection.

1. INTRODUCTION

Agriculture, which is the main stay of Nigeria's economy, has the bulk of her labour force engaged in one form of its enterprise. Dominating the non-oil sector, it consistently accounts for approximately 75% of Nigeria's non-oil generated revenue. Agricultural enterprises involve both animal husbandry and plant production; and they both contribute approximately 24.18% to the nation's gross domestic product [1].

Nigeria is endowed with an estimated 19.5 million cattle; 72.5 million goats; 41.3 million sheep; 7.1 million pigs; 974,499 donkeys; 273,840 camels; 145 million chickens; 11.6 million ducks and 2.1 million turkeys making Nigeria the topmost livestock producer in West Africa [2,3]; majority of which are kept by subsistence farmers.

Despite this huge and robust population of livestock, Nigeria is still a net importer of protein foods of animal origin. This low productivity has been attributed to the low genetic potential of our indigenous breeds, inadequate management practices, poor nutrition, poor reproductive performance, high disease incidence and parasite burden.

Diseases in animals have been documented to influence their productivity and fertility; and thus are considered to be a major cause of significant economic losses in the livestock industry [4]. Although some pathologies are as a result of multiple causative agents which would ultimately result in the condemnation of the meat; others are due to some parasites (e.g. live flukes) which can be identified at slaughter.

The abattoir and its regulations represent an important control point for livestock diseases by consistently performing routine (anti-and post-mortem) inspections. At these points, care is

taken in identifying diseased animals and their causative agents thus preventing the consumption of meat from such animals [5]. As many of such diseases and associated pathogens have the potential to infect multiple host species, including humans thereby constituting a public health issue.

In developing countries (Nigeria inclusive), slaughterhouses are known to have poor meat processing and inspection facilities, shortage of qualified meat inspectors and poor hygiene (butchers), hence may serve as a focal point for disease dissemination via the consumption of diseased/contaminated meat [6,7]. In addition, some owners of livestock have been known to dispose sick, debilitated and infertile animals for slaughter in an effort to minimize economic losses.

Research has also established that parasitic (fasciolosis, hydatidosis, cysticercosis, and oesophagostomiasis) and bacterial (tuberculosis, brucellosis, metritis, mastitis and leptospirosis) diseases are the major causes of organ condemnation hence a reduction in quality and quantity of meat [8,9,10,11,12,13]. Zoonotic diseases are yet to be fully eliminated in approximately 80% of the public abattoirs and slaughterhouses in Nigeria [14]; thus posing serious environmental and public health risks to the populace.

Post mortem inspection is commonly perceived as the sanitary control of infectious animal diseases and aims to provide safe and wholesome meat for human consumption. Inefficient meat inspection will ultimately result in the emergence of zoonotic diseases in man with severe adverse public health and economic consequences. This survey aims to review inspection records of livestock diseases encountered at slaughter from January, 2014 to December, 2016 at the Oja-tuntun slaughter slab in Ogbomoso town, Oyo state.

2. METHODOLOGY

A retrospective survey for disease conditions encountered from 1st January 2014 to 31st December, 2016 at point of slaughter was conducted using abattoir records. These records were obtained and kept by qualified staff of the abattoir. The personnel include one Veterinary surgeon (DVM), two veterinary inspectors (HND in Animal health) and two assistant meat inspectors (ND Animal health and production). Prior to the survey, ethical approval was obtained from the Coordinator, Bioresources Development Center, Ogbomoso and the Director, Veterinary Services, Ministry of Agriculture, Natural Resources and Rural Development, Ibadan, Oyo state.

Relevant information such as animal species, sex and number of animals slaughtered; type and frequency of diseases encountered were then documented. Routine abattoir meat (post-mortem) inspection involves the use of traditional inspection procedures that uses visual examination, palpitation and incision of organs and lymph nodes. Findings are then compared with that from ante-mortem observations; and recorded on a meat inspection disease analysis report sheet (daily, monthly and yearly records).

The data obtained was analyzed using simple descriptive statistics in excel spread-sheet. Analysis of Variance (ANOVA) was also employed to test the occurrence rate of animal disease conditions using the Statistical Analysis System [15]. In all the analysis $p < 0.05$ was set for level of significance.

3. RESULTS AND DISCUSSION

Diseases in livestock production constitute a major health care challenge as they are the main cause of zoonotic infections in man; and are the primary source of economic losses to both the consumer (health care bills) and the livestock farmer (increase in animal morbidity and mortality rates). Hence, the need for proper identification, understanding, management, prevention and documentation of diseases prevalent in livestock farming as this would go a long way in preventing the spread of such diseases to man; as well as reducing the financial implication on the economy. This survey aims at assessing the diseases encountered in livestock at the point of slaughter.

Thirteen thousand, one hundred and seventy-two (13,172) animals were inspected and examined for diseases during the study period. The survey revealed a slaughter rate of 90.4% bovine and 9.6% caprin (Table 1). A decline in the number of animals' slaughtered over the years was also observed as shown in Fig. 1. This decline in the number of animals slaughtered might be explained by the increase in the prices of the animals and or the decline in purchasing power of the people due to the recent economic recession in Nigeria.

The emergences of zoonotic diseases in man are known to not only result in high morbidity and mortality but also produce a constant strain on both the national and global public health care resources. The survey revealed a total of seven (7) diseases and conditions encountered in animals slaughtered across the years. The most frequently occurring diseases and condition encountered at the point of slaughter in 2014, 2015 and 2016 were pneumonia (22.8%), tuberculosis (25.3%) and fascioliasis (34.0%); pimply-gut (14.2%), pneumonia (29.7%) and fascioliasis (43.2%) and pimply-gut (18.1%), tuberculosis (27.7%) and fascioliasis (28.4%) respectively (Table 2). The presences of these diseases in animals tend to decrease the quality of meat and are also responsible for the spread of zoonotic diseases in man. The tropical nature of the study area has been shown to favor the growth of grasses and sedges that shelter the intermediate host (cercariae and snails (*Lymnaea spp*)) of fascioliasis and as such houses a large number of parasite reservoirs for cattle, goat and sheep [16]. Hence the high prevalence rate of Fascioliasis, a disease condition caused by different liver flukes (*Fasciola spp*) as documented across the years.

The high prevalence of fascioliasis revealed by this survey was in line with other studies done [17,18]; as they also reported high prevalence rates of flukes in the liver and fecal samples of cattle. Thereby, constituting a major cause of serious morbidity and mortality associated with ruminant animals in all parts of Nigeria and loss of income on the part of the farmer. There is also the possibility of human exposure to fascioliasis infection via the consumption of contaminated meat and vegetables as was reported amongst school children in Northern Nigeria [19].

This survey also revealed a high prevalence rate of Tuberculosis, an infectious disease caused by a group of closely related Mycobacterium

complex specifically *M. bovis*, which has the ability to infect both human and animals due to its wide host range and Pneumonia, an inflammation of the lungs resulting from multiple causative agents that can have serious public health consequences. The survey revealed a prevalence rate of 25.3% and 27.7% of tuberculosis in 2014 and 2016 respectively and also prevalence rate of 22.8%, 29.7% and 7.1% for pneumonia in the years 2014, 2015 and 2016 respectively. These results were in contrast with reports by Raji et al. [5]; Aliyu et al. [20] and Benard et al. [21].

However, the high prevalence rates reported in this survey may be due to prolonged exposure of animals to infectious agents; stress or exhaustion during long distance search for pasture and water; and prolong exposure of animals to disease causing agents during social regrouping in the livestock markets [20]. The economic impact of such diseases as it affects resource poor countries results in a dual impact; causing illness and death in man and animals, loss of income on the part of the farmer as well as direct and indirect losses on the national and global health care systems [22].

Further analysis of the retrieved data revealed a statistical significant difference ($p < 0.05$) in the

occurrence rate of diseases in the animals slaughtered (Table 3). The occurrence rate of fascioliasis amongst the animals slaughtered was significantly ($p < 0.05$) higher than other diseases encountered; whilst the least frequent was cysts and abscess as shown by the result. This result is in agreement with Nzalawahe et al. [23] who revealed a high occurrence rate of fascioliasis among cattle in Iringa Rural District.

The pattern of occurrence of zoonotic animal diseases shown by this survey reveals the endemic nature of the diseases encountered within the study area. One might attribute these to the lack of proper management of animals, irregular deworming programme, inadequate livestock vaccines and/or lack of vaccination of animals against infectious diseases and also the migration of animals from the north to the southern part of the country by livestock handlers who seek to gain the highest immediate profit. Hence the need to put in place experienced and qualified veterinary personnel; better inspection and examination programme to enhance disease diagnoses; and a comprehensive compensation plan so as to reduce the economic burden on the farmers in the case of diseased animals. These proposed measures are required to mitigate the spread of zoonotic animal diseases.

Table 1. Total number of animal species slaughtered from 2014-2016

Animal species	2014		2015		2016		Total number of animal species slaughtered (%)
	Male	Female	Male	Female	Male	Female	
Bovine	4,422	755	2,840	1,086	1,220	1,580	11,903 (90.4%)
Caprine	316	128	260	74	215	276	1,269 (9.6%)
Total							13,172

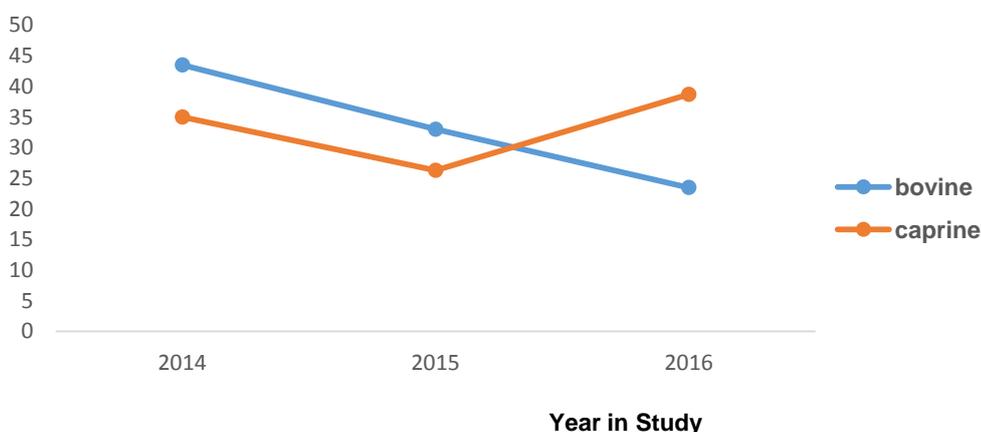


Fig. 1. Annual trend of animal species slaughtered at the Oja-tuntun slaughter slab from 2014-2016

Table 2. Annual prevalence rate of animal diseases encountered at slaughter from 2014-2016

Disease causal agent	Disease condition	2014 prevalence (%)	2015 prevalence (%)	2016 prevalence (%)
Bacterial	Tuberculosis	41 (25.3%)	10 (6.8%)	43 (27.7%)
	Abscess	1 (0.6%)	0 (0.0%)	16 (10.3%)
Parasitic	Fascioliasis	55 (34.0%)	64 (43.2%)	44 (28.4%)
	Pimply-gut	17 (10.5%)	21 (14.2%)	28 (18.1%)
	Cyst	2 (1.2%)	3 (2.0%)	2 (1.3%)
Multiple causal Agents	Pneumonia	37 (22.8%)	44 (29.7%)	11 (7.1%)
	Hepatitis	9 (5.6%)	6 (4.1%)	11 (7.1%)

Table 3. ANOVA result of the prevalence rate of animal diseases encountered at slaughter

Parameter	Mean±SEM
Fascioliasis	54.33±5.78 ^a
Tuberculosis	31.33±10.68 ^b
Pneumonia	30.67±10.04 ^b
Pimply-gut	22.00±3.22 ^{bc}
Hepatitis	8.67±1.45 ^c
Abscess	5.67±5.18 ^c
Cyst	2.33±0.33 ^c

^{a, b, c}: Means within each row with different superscript are significantly different ($p < 0.05$)

4. CONCLUSION

The prevalence of infectious diseases such as fascioliasis, tuberculosis, pneumonia, pimply-gut, hepatitis, abscess and cyst in the study area contributes to organ condemnation associated with economic losses and public health risk. In view of these findings, there is an urgent need for additional extensive epidemiological investigations for improved disease surveillance, patterns of spread and the economic importance of these diseases. Veterinary and public health officers in the abattoir need to remain vigilant in the identification of diseased animals and ensure accurate documentation. Hence, there is the need to sensitize the general public on good animal husbandry practices so as to prevent the continuous dissemination of zoonotic animal diseases to man.

CONSENT

Informed consent was obtained from the relevant authorities prior to data collection.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval was obtained.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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