NIPES

Journal of Science and Technology Research

Journal homepage: www.nipesjournals.org.ng

Fascioliasis Status of Cattle Slaughtered in Swali Market Abattoir, Bayelsa State

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Article Info

***Keywords*:**
Cattle, Fasciola hepatica, fascioliasis, status, abattoir

Received 28 November 2023
Revised 11 December 2023
Accepted 12 December 2023
Available online 9 March 2024

https://doi.org/10.5281/zenodo.10800968

Abstract

Fascioliasis causes stunted growth, lower milk and meat production and liver damage in infected animals. Two hundred and eighty-six (286) cattle, 141 males and 145 females, of different breeds slaughtered at Swali market Abattoir in Bayelsa State were examined by carefully incising the liver along the biliary and the infected livers were squeezed with gloved hand and the flukes were carefully removed and placed into bottles with formol-saline. Consent was obtained from the cattle rearers before sampling; and information about the breed, sex and age of the cattle examined were obtained orally at the point of sampling and recorded against each sample bottle. Chi-square (χ^2) test was used to test any relationship between the prevalence of fascioliasis and breed, sex and age of cattle examined at 0.05% significant levels using SPSS version 23. An overall prevalence of 47.56% was recorded for infection with fascioliasis. Infection rates based on breeds examined revealed white Fulani to be most infected (46.32%), while Bayelsa palm showed the least infection (2.21%). Female cattle recorded higher prevalence of fascioliasis (56.55%) than males (38.30%). Higher prevalence of infection was recorded in cattle ≤4 years (58.97%) than in those >4years (33.85%). Although the prevalence of infections by breed, sex and age of the cattle varied, the study showed statistically significant association ($p<0.05$). This study result depicts favorable environment for the thriving of the snail intermediate host. An integrated approach towards parasite control which should be farm specific should be employed in the study area.

1.0. Introduction

Raising cattle is a major animal husbandry business in Nigeria. It's an important asset for both traditional and modern farming, providing meat and milk as well as jobs and income for families [1]. In certain more traditional settings, it serves as a sign of family wealth or even just as a way to get by for nomadic people [1].

Fasciola gigantica and *Fasciola hepatica*, trematodes, cause fascioliasis [2] with often overlapping prevalence in many African countries, although with specific ecological requirements and distinct snail intermediate host [3]. These snails act as intermediate hosts, and *Fasciola* infection is spread between animals and humans [4]. Animals transmit the parasite to human by human eating infected animal liver, and human to human transmission occurs through the faeco-oral route by ingesting the eggs/larvae [5]. Animal get infected from eating infected feed, water and grass [6]. Adult *Fasciola* flukes living in the bile ducts of infected animal release eggs which then end up in water, hatch and

become larvae in certain freshwater snails depending on certain environmental factors. Moreover, human activities contribute greatly to the transmission of the parasites [7]. Weak body conditions make animals more susceptible to trematodes infection [8].

Bovine fascioliasis is indicated by inflammation of the liver and bile ducts [9] and infected livers are often condemned at slaughter houses, resulting in economic losses. The value of the losses resulting from this disease runs into millions of naira [10]. However, lack of reliable information on the disease prevalence has prevented proper estimation of the economic losses caused at all levels [11]. The economic losses resulting from the infection are estimated to be in millions of naira, leaving farmers in perpetual poverty as they are denied the needed income [12]. Additional expenses incurred from purchase of antihelminthics for treatment form part of economic losses associated with the disease. Besides direct financial losses, there are also other non-quantifiable or tangible losses experienced, like decreased milk and wool production, reduced weight gain, metabolic diseases, and infertility [13]; [14]. This study aimed at determining the status of fascioliasis in cattle slaughtered in Swali market abattoir, Bayelsa State through direct examination of the liver for adult flukes.

2.0. Materials and Methods

2.1. Study area

The study was conducted in Swali market abattoir (slaughter) in Yenagoa Local Government Area, Bayelsa State. Swali market abattoir is located in Swali community close to Ekoli creek, and it is the largest abattoir in Yenagoa. The area is located at latitude 4° 55′ 09″ N and longitude 6° 16′ 05.1″ E. The abattoir is sectioned into two; the part where the animals are slaughtered which are upland and the washing section where they are cleaned in the river. About 200 cows are killed on weekly basis with most of the wastes discharged directly into the river water untreated

2.2. Sample Collection

Two hundred and eighty-six (286) cattle comprising of 141 males and 145 females were examined after slaughter by carefully incising the liver along the biliary tracts, avoiding any damage to the parasite. The infected livers were squeezed with gloved hand and the flukes were carefully removed and placed into sterile sample bottles containing formol saline as described by [4], and transported to the laboratory of the Department of Biology of Federal University Otuoke for identification. Before the sample collection, consent of the cattle rearers were sought and obtained; and information about the breed, sex and age of the cattle examined were obtained orally from them at the point of sampling and recorded against each sample bottle.

2.3. Data analysis

Chi-square (χ^2) test was used to test any relationship between the prevalence of fascioliasis and breed, sex and age of cattle examined at 0.05% significant levels using SPSS version 23.

3.0. Results

3.1. Prevalence of fascioliasis in different breeds of cattle slaughtered in Swali abattoir

A total of two hundred and eighty-six (286) cattle were examined for *Fasciola* sp. infection, out of which 136 samples were infected, giving an overall prevalence of 47.56%. Five breeds of cattle where recorded and infection rates based on breeds examined revealed white Fulani to be most infected (46.32%), followed by Kaduna breed (24.26%), while Bayelsa palm showed the least infection (2.21%). Only 3(6.25%) of the 48 Bayelsa Palm breed were infected; 22(52.38%) of the 42 Sokoto breed were infected, and 15(37.50%) of the 40 Taraba breeds were infected. There was a significant association between infection with *Fasciola* sp. and the cattle breed ($p<0.05$) (Table 1).

Table 1: Prevalence of fascioliasis infection among different cattle breed slaughtered in Swali Abattoir, Bayelsa State.

Breed	No examined	No. infected (%)	Overall prevalence (%)	χ^2	P-VALUE
White Fulani	96	63 (65.63)	46.32		
Kaduna	60	33(55.00)	24.26		
Bayelsa Palm	48	03(06.25)	02.21		
Sokoto	42	22(52.38)	16.18		
Taraba	40	15(37.50)	11.03		
Total	**286**	**136 (47.56)**	**100**	**48.751**	**0.00001**

3.2. Sex-Related Prevalence of Fascioliasis among cattle slaughtered in Swali Abattoir.

Based on sex, female cattle recorded a higher prevalence of fascioliasis (56.55%) than males (38.30%). There was however high significant difference in the infection rates between the two sexes ($p<0.05$) (Table 2).

Table 2: Sex-Related Prevalence of Fascioliasis among cattle slaughtered in Swali Abattoir

Sex	No examined	No. Infected (%)	χ^2	P-value
Male	141	54(38.30)		
Female	145	82(56.55)		
Total	**286**	**136(47.56)**	**9.550**	**0.001**

3.3. Prevalence of Fascioliasis infection by age amongst cattle slaughtered in Swali Abattoir

Prevalence of infection according to age showed more prevalence of infection in cattle ≤4 years (58.97%) than in those >4years (33.85%). There was however a significant difference in the infection rates in all the age group ($p<0.05$) (Table 3).

Table 3: Age-Related Prevalence of Fascioliasis infection amongst cattle slaughtered in Swali Abattoir

Age	No examined	No. Infected (%)	χ^2	P-value
≤4 years	156	92(58.97)		
>4years	130	44(33.85)		
Total	**286**	**136(47.56)**	**17.950**	**0.00002**

3.4. Discussion

The study revealed 47.56% overall prevalence of fascioliasis in cattle slaughtered in Swali market abattoir in Yenagoa Local Government Area of Bayelsa State. This result is higher than the 21.8%, 27.68% and 10.51% reported by [15-17] in their respective studies. However, the result is lower than that of [18] and [19] who recorded 65.7% and 64.5% prevalence respectively. The sample size,

type of sample examined, method of analysis used, the season of study, as well as the researcher's ability to detect the infection could be the reason for variations in the prevalence results. This study actually involved post-mortem examination of the liver of the slaughtered cattle during rainy season and researches carried out during rainy seasons had higher prevalence rates than those done in dry seasons as snails, which act as intermediate host to the parasite, are more common during rainy season [17]. Coprological test, the commonly used diagnostic technique in both veterinary and human parasitology, is less sensitive than post-mortem examination of the liver in identifying fascioliasis [20]; [21]. Fasciola eggs can be found in faeces 8-15 weeks after infection. As a result, during the prepatent stage, it is unreliable to identify Fasciola eggs since they are periodically released, contingent upon the gall bladder's evacuation [22]. Elisa tests allow for detection 2-4 weeks post-infection and well before the patent period; however, antibodies do not always indicate an active infection because they do not immediately correlate with parasite numbers and can persist for weeks after the infection is stopped [22].

High infection rates in this study could be linked to the extensive system of farming by the cattle farmers in the northern Nigeria, where the animals were purchased with little or no veterinary services rendered to the animals by the farmers, as well as the type of sample examined. Animal trade and movements are common in Nigeria, but in most cases, the last reported area of origin of the slaughter animals prior to transportation to the abattoir are noted by the rearers [18]. Animals managed under an intensive system have a lower infection rate compared to animals maintained under an extensive system of management which subject cattle to parasite eggs exposure [23]. The range land systems (Artificial pasture land) seem to be the panacea to fascioliasis in cattle [17]. Conversely, herds that receive subpar veterinary care and/or inconsistent deworming procedures are likely to experience a higher prevalence [18]. The high prevalence recorded in this study could also suggest that the Yenagoa plain and its environs are where the animals contracted the infection while grazing. This may be explained by the local climate and environment, which promote the survival of the intermediate hosts, *Lymnaea* snails [16]. Nonetheless, the increasing risk of the disease for both human populations and livestock populations may have been caused by recent changes in the environment and climate brought on by global warming and adjustments in human behavior [24]; [25].

This study results also indicated significant difference in prevalence among the various cattle breeds ($p<0.05$). This disagrees with [18] who observed no significant association between cattle breed and infestation. The difference in infection rate across breeds of cattle may be attributed to the rearing system adopted in the sample areas.

The study again recorded a significant difference ($p<0.05$) in fascioliasis prevalence in relation to sex of cattle, with females recording a higher prevalence than their male counterparts, which agrees with the findings of [26] and [15]. However, result of the current study disagrees with the reports of [27], [16] and [28] where the prevalence of fasciolosis was higher in males than females and also, no significant relationship was recorded between sexes of cattle and *Fasciola* infection. Although male and female cattle graze in the same field, females having a higher infection rate than males might mean there existence a difference in sex-related susceptibility [24]. There are several possible explanations for this difference in susceptibility between the sexes, including extrinsic factors like environment and management techniques and intrinsic aspects like genetics, physiology, and immunology [16]. The variation could also be because the females stay longer in the herd (for breeding and milk production), hence an increase in the disease burden [29]; [30].

Age-related distribution of infection was also significant ($p<0.05$). This disagrees with the work of [26] who reported no significant relationship between the infection rate of fascioliasis and age of cattle. This result of this work is however not different from that of [18] who revealed a lower infection rate in older cattle of 6 – 10 years. The low incidence in older cattle may be related to the parasite's ability to elicit immune response, which helps stimulate acquired immunity in older

animals [31]. Young cattle are more likely to get infected with *Fasciola* metacercariae because they graze pastures more frequently and are exposed for longer periods of time [32].

4.0. Conclusion

The result of this study confirmed that bovine fascioliasis is present in the study area. This depicts favorable environment for the thriving of the snail host, which aids spread of the parasites. The abundance of slow flowing freshwater bodies increases the risk of infection. An integrated approach towards parasite control should be employed in the Herd Health Plan on any farm. Control should be specific to farm and all animals must be considered and handled together as cattle and other ruminants are at risk of liver flukes infection.

Acknowledgement

The authors immensely appreciate the cattle rearers in Swali market Abattoir for their consent and responses. The support of Laboratory Technologists in the Department of Biology, Federal University Otuoke, Bayelsa State is sincerely appreciated.

Conflict of Interests

Authors declare there is no conflict of interests.

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