Original Research Article
DOI: https://www.doi.org/10.62418/ijvph.11.2.2025.65-71

A Retrospective Study of Zoonotic Fasciolosis in Slaughtered Food Animals at Damaturu Modern Abattoir, Yobe State, Nigeria: Implications for Public Health and One Health Interventions

Kachalla Alhaji Modu [(1)*], Bukar Tijjani [(1)], Mustapha Abubakar [(2)], Mohammed Malah [(2)], Aisha Gambo [(2)], Saleh Dawud [(1)], Shuaibu Hussaini [(1)], Ali Idris Balbaya [(3)], Yusuf Modu Bole [(4)]

[(1)]Department of Veterinary Public Health and Epidemiology, Ministry of Livestock Development, Yobe State, Nigeria., [(2)]Department of Animal Health and Production Technology, Yobe State College of Agriculture Science and Technology, Gujba, [(3)]Veterinary Medicine and Allied Products Directorate (VMAP), National Agency for Food and Drugs Administration and Control (NAFDAC), Nigeria, [(4)]Federal College of Veterinary and Medical Laboratory Technology, Vom, Plateau State, Nigeria

(Received: 30th August 2025 | Accepted: 12th December 2025)

Abstract

This research is a retrospective study of zoonotic fasciolosis in slaughtered food animals at Damaturu Modern Abattoir, Yobe State, Nigeria: implications for public health and one health interventions, over a five-year period (January 2020 – December 2024) with the aim of determining the prevalence of fasciolosis in slaughtered food animals. Meat inspection records were reviewed for diagnosed cases of fasciolosis among cattle, sheep, and goats using a retrospective study design and analyzed using descriptive statistics basically frequencies and percentages. A total of 124,914 animals were examined, comprising 38,929 sheep, 79,162 goats, and 6,823 cattle. Of these, 96 animals tested positive, resulting in an overall prevalence of 0.08%. Species-specific prevalence was highest in cattle (1.20%), followed by sheep (0.03%) and goats (0.0037%). Temporal analysis revealed fluctuations across years, with the highest annual prevalence recorded in 2024 (0.12%) and peak monthly rates in August and December (0.17%). Seasonally, the rainy period recorded the highest prevalence (0.13%), followed by the harmattan season (0.10%) and dry season (0.02%). Cattle consistently showed higher prevalence across all seasons. The relatively low overall prevalence suggests improved control efforts, but fasciolosis remains a zoonotic concern due to its public health relevance. Continued surveillance and integrated One Health control strategies are recommended to mitigate transmission risks and ensure food safety.

Keywords: Zoonotic, *Fasciola*, Abattoir, One health, Retrospective

Introduction:

Fasciolosis is an ancient neglected food-borne zoonotic disease of medical importance, caused by certain macroscopic, leaf-shaped digenetic trematodes to the genus Fasciola (WHO, 2019a). The disease was brought to the fore in 1379, when French scientist Jehan de Brie described the first known parasite, *Fasciola hepatica* (Hugh-Jones et al., 1995). Currently, it is being investigated whether the alleged hybrid species of *F. hepatica* and *F. gigantica* have a true taxonomic status (CDC, 2018a). Eating habits are the most significant risk factors of infection by *Fasciola* species with the consumption of wild watercress contaminated with infective metacercariae being the most reported sources of infection. Likewise, studies in the highlands of Peru indicate that drinking untreated water is associated with a higher risk of *Fasciola* spp. infection (Caravedo and Cabada, 2020). These trematodes occur on every continent, putting an estimated 180 million people at risk. More than 2.4 million people in over 70 countries are believed to be affected by fasciolosis (WHO, 2019a; WHO, 2019b). Meanwhile, it is estimated that *F. hepatica* infects more than 300 million livestock and 250 million sheep worldwide, and that, in accordance with *F. gigantica*, it causes an annual economic loss of $3.3 billion (Mas-Coma et al., 2014). Recent evidence indicates a significant increase in the prevalence of human fasciolosis worldwide (WHO, 2019a; Diyana et al., 2019) and a strong correlation with the high rate of infection among ruminant definitive hosts (Ashrafi et al., 2014). Fasciolosis is endemic on all continents of the world, except Antarctica. The disease has been documented in Africa, Asia, the Caribbean, Europe, Latin America, the Middle East, and Oceania (CDC, 2018b). Elevated human fasciolosis transmission rates have been observed in the Andean highlands of Bolivia and Peru, the Nile Valley, the Caspian Sea region, and parts of East and Southeast Asia (WHO, 2019d).

In sub-Saharan Africa (SSA), fasciolosis was reported in West Africa (Kelly et al., 2019; Elelu et al., 2016), East Africa (Dida et al., 2014) and South Africa (Mochankana and Roertson, 2016; Nyirenda et al., 2019). However, it has also been reported in Egypt (other than the SSA), North Africa (Keiser et al., 2011; Elshraway and

Mahmoud, 2017). In Nigeria, a recent cross-sectional study conducted in North Central Nigeria collected 686 fecal samples from cattle across 11 villages; 110 tested positives for Fasciola gigantica eggs, indicating a prevalence of 16% (Elelu et al., 2016). However, a decade-long study (2005–2014) in that geopolitical zone reported a prevalence of 32.34% (Yatswako and Alhaji, 2017). In South-South Nigeria, a study reported fasciolosis prevalence rates of 44.8% in cattle and 36% in goats, involving both *F. gigantica* and *F. hepatica* (Abraham and Jude, 2014). Conversely, another study in the same zone reported a low prevalence of 5.34% from 712 randomly sampled cattle (Eze and Briggs, 2018). In the North-East, a study of 262 gall bladders from White Fulani cattle reported 28.2% prevalence (Shinggu et al., 2019). A recent longitudinal study conducted in another part of the North East analyzed 7,640 fecal and gall bladder samples from slaughtered cattle, sheep, and goats. Of these, 3,092 tested positives for *F. gigantica* and *F. hepatica*, indicating a prevalence of 40.5% (Isah, 2019). In southwestern Nigeria, a cross-sectional study involving 905 fecal samples found an overall prevalence of 7.07%, with *F. gigantica* predominating (84.38%) over *F. hepatica* (1.56%) (Afolabi and Olususi, 2016). A cross-sectional survey in North-West Nigeria, based on fecal and bile samples from 224 cattle, reported a prevalence of 27.68% (Magaji et al., 2014). Another survey of slaughtered cattle, sheep, and goats in the same zone found a *F. hepatica* prevalence of 29.6% (Kiran and Asma'US, 2017). There is a gap in knowledge regarding the status of fasciola infection in Yobe state. Current research is mainly limited to a retrospective study conducted at the Damaturu modern abattoir. This study therefore aims to determine the prevalence of fasciolosis in slaughtered cattle, sheep, and goats at the Damaturu Modern abattoir, Yobe State, Nigeria.

Materials and Methods:

Study Area

The study was conducted at the Damaturu Modern Abattoir, which is situated along Potiskum Road in Damaturu. Damaturu is the capital of Yobe State, located between latitude 11°39'30''–11°47'00'' N and longitude 11°54'00''–12°02'00'' E. The city covers a land area of 2,366 square kilometers and had a population of 88,014 as of the 2006 National Population Census (NPC, 2006). Damaturu shares boundaries with Tarmuwa Local Government Area to the north, Kaga Local Government Area of Borno State to the east, Gujba Local Government Area to the south, and Fune Local Government Area to the west. The town is characterized by semi-arid savannah vegetation and experiences a prolonged hot season, with average maximum temperatures ranging from 38°C to 42°C. The region faces significant desertification, resulting in sandy terrain during the dry season and muddy conditions during the rainy season. These environmental conditions often make the terrain difficult to navigate, and many communities are classified as hard to reach.

Study Design

A retrospective study design was adopted, involving the review and analysis of meat inspection records over a five-year period to determine the prevalence of fasciolosis in slaughtered animals and its potential public health implications in Yobe State, Nigeria.

Data Collection and Study Period

Data were collected from January 2020 to December 2024, encompassing five consecutive years. Secondary data on all diagnosed and confirmed cases of fasciolosis were obtained from the official meat inspection records of the Damaturu Modern Abattoir, Yobe State. Extracted information included the date of slaughter, species of animals slaughtered, total number of animals slaughtered per day/month, and the number of animals diagnosed with fasciolosis. The records were reviewed manually and entered into a Microsoft Excel spreadsheet for further analysis.

Inclusion and Exclusion Criteria

All food animals slaughtered at Damaturu Modern Abattoir with complete inspection records were included in the study, while animals with incomplete or missing data, or those slaughtered outside the abattoir setting, were excluded.

Data Analysis

The data were entered into a Microsoft Excel spreadsheet, sorted, cleaned, and analyzed using descriptive statistics basically frequencies and percentages, to determine the annual and monthly prevalence of fasciolosis, prevalence by species, and trends over time.

Ethical Considerations

This study utilized secondary data from abattoir records books without any direct involvement of animals or humans. Permission to access the records was obtained from the abattoir authorities under the Yobe State Ministry of Livestock Development. Confidentiality of all data was strictly maintained.

Results and Discussion:

A total of 124,914 food animals comprising of 38,929 sheep, 79,162 goats, and 6,823 cattle were slaughtered at the abattoir between January 2020 to December 2024. Of these, 96 animals were found to be infected with fasciolosis giving an overall prevalence of 0.08%. Sheep had a prevalence of 0.03% while goats recorded the lowest prevalence of 0.0037%. In contrast, cattle showed

the highest prevalence of 1.20% as presented in figure 1. Of the yearly analysis revealed fluctuations in prevalence across the study period. The highest prevalence 33 (0.12%) was recorded in 2025 followed by 24 (0.075) in 2020, 17 (0.06%) in 2023, 17 (0.08%) in 2022 while lowest prevalence 7 (0.03%) was recorded in 2021 as presented in figure 2. Over the five-year period, monthly analysis revealed variations in fasciolosis prevalence among slaughtered food animals. The highest prevalence was recorded in August (0.17) and December (0.17%), followed by September (0.14% and January (0.13%). The lowest prevalence occurred in May (0.01%), with relatively low values also in March (0.02%) and June (0.03%) as presented in table 1 and figure 3. Seasonal analysis showed that fasciolosis occurred in all three seasons of the year, with rainy season recorded 40 positive cases out of 28,782 animals examined, giving a prevalence of 0.13%. The harmattan season also showed a prevalence of 0.10%. in contrast, the dry season had the lowest prevalence of 0.02% as presented in figure 4. Cattle showed the highest prevalence across all seasons. During the rainy season, 1.6% (28/1,666) of the cattle was positive, followed by 1.05% (41/3,880) in the harmattan season and 0.9% (12/1,277) in the dry season. Sheep recorded 0.04% in both the dry season (5/12,315) and harmattan season (6/13,051), with no positive cases in the rainy season (0/13,563). Goats had the lowest prevalence, with 0.003% in the dry season (2/27,116), and 0.004% in the harmattan season (1/24,240) as presented in table 2.

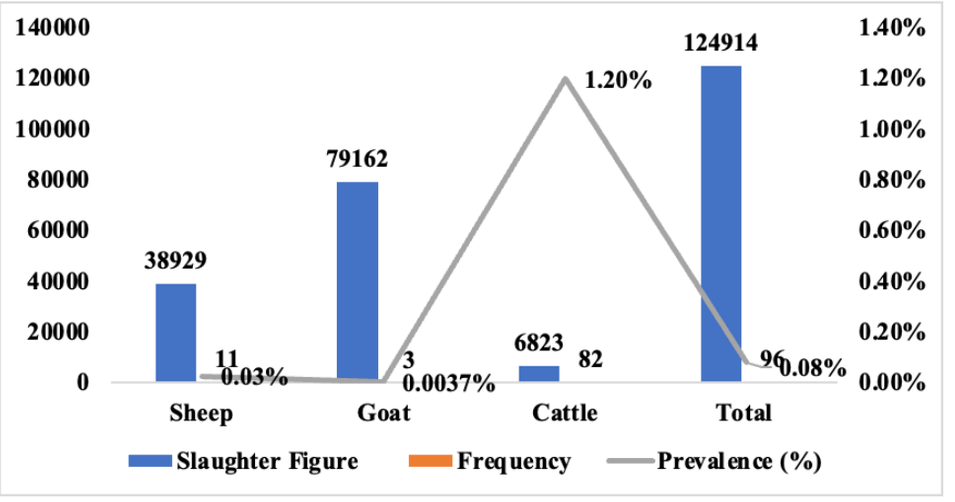

Figure 1: Overall Prevalence of Fasciolosis among Slaughtered Food Animals in Abattoir 2020-2024

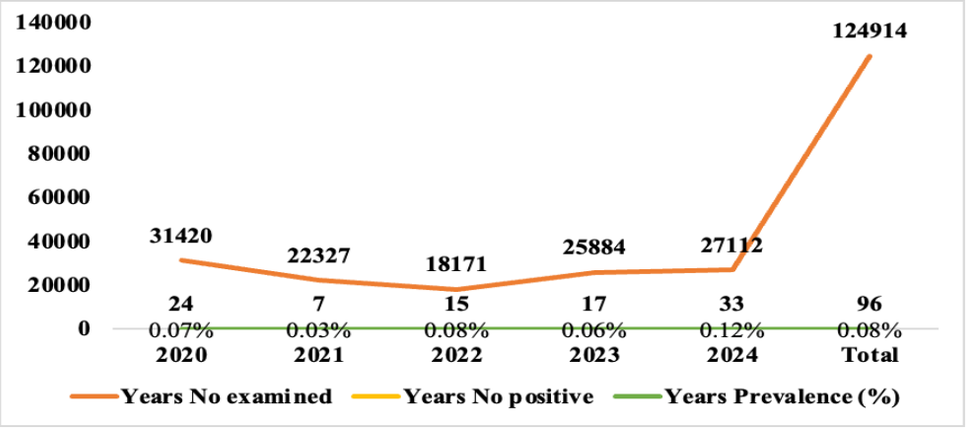

Figure 2: Yearly Trend in Fasciola Prevalence and Case Numbers From 2020-2024

Table 1: Monthly Prevalence of Fasciola by Months for the Period of 2020-2024			
Months	**Total Examined**	**Total Positive**	**Prevalence (%)**
January	10,283	14	0.13%
February	10,180	7	0.06%
March	14,042	4	0.02%
April	14854	12	0.08%
May	12,709	2	0.01%
June	12,714	4	0.03%
July	9,976	4	0.04%
August	10,448	18	0.17%
September	9,575	14	0.14%
October	7,468	7	0.09%
November	5,834	4	0.06%
December	6,831	12	0.17%
TOTAL	**124,914**	**96**	1.0%

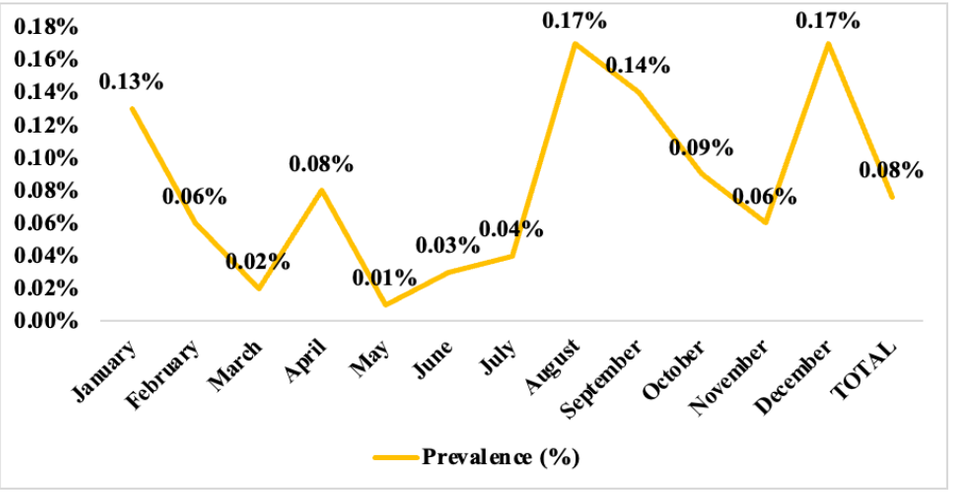

Figure 3: Prevalence Trend of Fasciolosis in Slaughtered Food Animals (2020-2024)

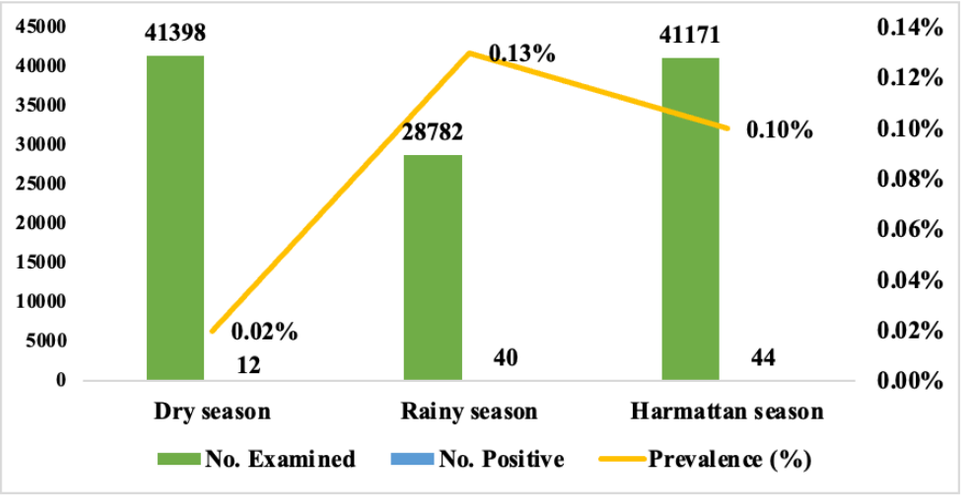

Figure 4: Overall Seasonal Trend in Fasciolosis Prevalence and Cases in Slaughtered Food Animals

Table 2: Seasonal Prevalence by Species Specific

Seasons of the Years	Cattle Slaughter Figure	Prevalence (%)	Sheep Slaughter figure	Prevalence (%)	Goat slaughter figure	Prevalence (%)
Dry season	1,277	12 (0.9%)	12315	5 (0.04%)	27,806	1 (0.003%
Rainy season	1,666	28 (1.6%)	13563	0 (0.0%)	27,116	2 (0.007%)
Harmattan season	3,880	41 (1.05%)	13,051	6 (0.04%)	24,240	1 (0.004%)

This study investigated the prevalence of fasciolosis in slaughtered food animals (sheep, goats, and cattle) at the abattoir between January 2020 and December 2024. An overall prevalence of 0.077% was recorded, indicating a relatively low occurrence of the disease in the study area. However, it remains a public health concern due to its zoonotic potential, as it can cause severe liver damage in humans, particularly in areas with close livestock contact and poor water sanitation. From a One Health perspective, its persistence is driven by interconnected human, animal, and environmental factors, requiring integrated control measures. The prevalence of fasciolosis observed in this study (0.077%) is considerably lower than values reported in other parts of Nigeria: Mbaya et al*.,* (2010) reported a prevalence of 0.7% in the North-East, while Elelu et al*.,* (2016) recorded 16% in the North-Central region. Outside Nigeria, prevalence rates of 0.09% in Botswana (Mochankana and Robert, 2016), 3.8% in Sudan (Kheder and Mohamed, 2021), and 8.5% in South Africa (Sophy et al*.,* 2025) have been reported. A decade-long study (2005–2014) in the same geopolitical zone recorded a much higher prevalence of 32.34% (Yatswako and Alhaji, 2017). In South-South Nigeria, Abraham and Jude (2014) reported prevalence rates of 44.8% in cattle and 36% in goats. The low prevalence recorded in the present study could be attributed to several factors, including improved meat inspection practices, possible changes in climatic conditions affecting the intermediate snail host population, and differences in grazing systems that limit exposure to contaminated pasture. Additionally, routine anthelmintic use by livestock owners in the region might have contributed to the reduced parasite burden in animals presented for slaughter. In species-specific, our study revealed the highest prevalence (1.20%) in cattle, which is consistent with the findings of Usman (2019), who reported a higher prevalence in cattle. However, this is inconsistent with previous reports in Nigeria indicating that sheep are more susceptible to *Fasciola* infection (Mbaya et al*.,* 2010). The current study showed that sheep recorded a much lower prevalence (0.027%), while goats had the lowest prevalence (0.0037%). The lower prevalence in goats may be attributed to their browsing behavior, which reduces contact with metacercariae-contaminated grasses. In yearly variation: In the current study, the highest prevalence (0.12%) was recorded in 2024, while the lowest prevalence (0.03%) was observed in 2021. These variations may be linked to inter-annual changes in rainfall patterns, temperature, and humidity, which influence the abundance and activity of the intermediate snail hosts. Socio-economic factors, such as fluctuations in animal supply to the abattoir and seasonal movements of pastoralists, may also have contributed. In monthly trends: The current study revealed that fasciolosis prevalence peaked in August (0.17%) and December (0.17%), a finding similar to the report of Usman (2019) in Nigeria. The August peak coincides with the height of the rainy season, when environmental conditions favor the proliferation of *Lymnaea* snails and the maturation of infective metacercariae. The December peak may be linked to increased livestock trade and slaughter during festive periods, bringing in animals from diverse ecological zones, including high-risk areas. The lowest prevalence, recorded in May (0.01%), is also consistent with the findings of Usman (2019). This lower prevalence in May may be due to dry-season conditions, which reduce snail habitats and interrupt the parasite's life cycle. In Seasonal variation: This study showed that the highest seasonal prevalence was recorded during the rainy season (0.13%), followed by the harmattan season (0.10%) and the dry season (0.02%). This finding is consistent with the report by Mbaya et al*.,* (2010), who also recorded a higher prevalence during the rainy season. However, in species-specific seasonal differences, cattle showed the highest prevalence during the rainy season (1.6%), aligning with the snail population surge during this period. Sheep and goats maintained consistently low prevalence across all seasons, further supporting the influence of feeding habits and inherent species resistance. The finding of higher prevalence during the rainy season in cattle is consistent with the reports of Mbaya et al*.,* (2010) and Usman (2019).

Conclusion:

In conclusion, this study found a low overall prevalence (0.077%) of fasciolosis in slaughtered cattle, sheep, and goats over a five-year period, with cattle being the most affected and goats the least. Prevalence varied by year, month, and season, with peaks in August and December, and higher rates observed during the rainy season.

Although lower than reports from other regions, fasciolosis remains a public health concern due to its zoonotic potential, warranting sustained surveillance and integrated One Health control measures.

Recommendations

i. Strengthen abattoir meat inspection to detect and remove infected livers early.

ii. Implement integrated One Health control strategies involving veterinary, public health, and environmental sectors.

iii. Promote routine and targeted deworming of livestock, especially before peak transmission seasons.

iv. Improve pasture and water management to reduce exposure to contaminated wetlands.

v. Incorporate seasonal and climatic data into fasciolosis surveillance programs.

vi. Educate farmers on transmission, prevention, and the importance of regular veterinary care.

vii. Conduct further research on parasite strains, snail vector distribution, and climate change impacts.

Conflict of interest:

The authors declared that they have no conflict of interest

Funding:

Not applicable

Authors' contribution:

The study was designed by Kachalla A.M., Bukar T., and Mustapha A., who also drafted the manuscript. Dawud S., Mala M., Aisha G., and Abdulkarim M. collected and extracted the data. Shuaibu H. and Balbaya A.I analyzed the data. Y.M Bole. critically reviewed the manuscript. All authors read and approved the final version.

Acknowledgements:

The authors wish to acknowledge the management of the Modern Abattoir, Damaturu, Yobe State, Nigeria, for their support.

References:

Abraham JT, Jude IB. Fasciolosis in cattle and goat slaughtered at Calabar abattoirs. Journal of Biology, Agriculture and Healthcare. 2014; 4(18): 34-40

Afolabi OJ, Olususi FC. The prevalence of Fasciolosis among slaughtered cattle in Akure, Nigeria. Molecular Pathogens. 2016; 7(1): 1-5. DOI: 10.5376/mp.2016.07.0001

Ashrafi K, Bargues MD, O'Neill S, and Mas-Coma S. Fasciolosis: A worldwide parasitic disease of importance in travel medicine. Travel Medicine and Infectious Disease. 2014; 12: 636-49

Caravedo MA, Cabada MM (2020). Human fasciolosis: Current epidemiological status and strategies for diagnosis, treatment and control. Res Rep Trop med. 11:149-58.

Centre for Disease Control. Fasciola. 2018a. https://www.cdc.gov/parasites /fasciola/biology.html.

Centre for Disease Control. Fasciola: Epidemiology and risk factors. 2018b. https://www.cdc.gov/ parasites/fasciola/epi.html.

Dida GO, Gelder FB, Anyona DN, Matano A-S, Abuom PO, Adoka SO, et al. Distribution and abundance of schistosomiasis and fasciolosis host snails along the Mara River in Kenya and Tanzania. Infection Ecology & Epidemiology. 2014; 4: 24281. DOI: 10.3402/iee. v4.24281

Diyana JNA, Lokman IH, Fazila SHN, Latiffah H, Ibitoye EB, Hazfalinda HN, et al. A retrospective study on bovine fasciolosis in veterinary regional laboratories in Peninsular Malaysia. Journal of Parasitology Research. 2019; 2019: 7903682. DOI: 10.1155/2019/7903682

Elelu N, Ambali A, Coles GC, Eisler MC. Cross-sectional study of Fasciola gigantica and other trematode infections of cattle in Edu local government area, Kwara state, North-Central Nigeria. Parasites & Vectors. 2016; 9: 470. DOI: 10.1186/s13071-016-1737-5

Elshraway NT, Mahmoud WG. Prevalence of fasciolosis (liver flukes) infection in cattle and buffaloes slaughtered at the municipal abattoir of El-Kharga, Egypt. Veterinary World. 2017; 10(8): 914-7. DOI: 10.14202/vetworld.2017.914-917

Eze NC, Briggs AA. Prevalence of Fasciolosis and histopathology of the liver in cattle slaughtered in Port Harcourt Abattoir, River's state Nigeria. World News of Natural Sciences. 2018; 16:105-16

Hugh-Jones ME, Hubbert WT, Hagstad HV. Chronology of Events in Zoonoses: Recognition, Control, and Prevention. Iowa: Iowa State University Press; 1995. Pp. 11

Isah U.M. Studies on the prevalence of fasciolosis among ruminant animals in northern Bauchi state, North-Eastern Nigeria. Parasite Epidemiology and Control. 2019; 3: e00090

Keiser J, Sayed H, El-Ghanam M, Sabry H, Anani S, El-Wakeel A, et al. Efficacy and safety of Artemether in

the treatment of chronic fasciolosis in Egypt: Exploratory phase-2 trials. PLoS Neglected Tropical Diseases. 2011; 5(9): e1285. DOI: 10.1371/journal.pntd.0001285

Kelly RF, Mazer S, Hartley C, Hamma SM, Ngwa VN, Nkongho EF, et al. Assessing the performance of a Fasciola gigantica serum antibody ELISA to estimate prevalence in cattle in Cameroon. BMC Veterinary Research. 2019; 15:8

Kheder D, Mohammed A. A study on causes of cattle liver condemnation at an abattoir in omdurman area, Khartoum state, sudan. BMC Vet Res, 2021; 17, Pp.58.

Kiran S, Asma'US T. Prevalence of fasvcioliasis among animals slaughtered at Sokoto state abattoir. International journal of malaria and tropical diseases. 2017; 1(11): 059-62.

Magaji AA, Ibrahim K, Salihu MD, Saulawa MA, Mohammed AA, Musawa AI. Prevalence of fasciolosis in cattle slaughtered in Sokoto Metropolitan Abattoir, Sokoto, Nigeria. Advances in Epidemiology. 2014; 2014: 247258. DOI: 10.1155/2014/247258.

Mas-Coma S, Bargues MD, Valero MA. Diagnosis of human fasciolosis by stool and blood techniques: Update for the present global scenario. Parasitology. 2014; 141: 1918-46

Mbaya AM, Shingu P, Luka J. A retrospective study of *Fasciola* infection in sheep and goat at slaughter and associated economic losses from condemnation of infected liver in maiduguri abattoir, Nigeria. Nigeria Veterinary Journal. 2010; 31(3): Pp 224-8.

Mochankana ME, Robertson I.D. A retrospective study of the prevalence of bovine fasciolosis at major abattoirs of Botswana, Onderstepoor Journal of Veterinary Research. 2021; 83(1), 1-5. http://dx.doi.rg/10.4102/ojvr.v83i1.1015.

NPC. *Nigerian national population census report*. National Population Commission; 2006.

Nyirenda SS, Sakala M, Moonde L, Kayesa E, Fandamu P, Banda F, et al. Prevalence of bovine fasciolosis and economic impact associated with liver condemnation in abattoirs in Mongu district of Zambia. BMC Veterinary Research. 2019; 15:33. DOI: 10.1186/s12917-019-1777-0

Shinggu PA, Olufemi OT, Nwuku JA, Baba-Onoja EBT, Iyawa PD. Liver Flukes Egg Infection and Associated Risk Factors in White Fulani Cattle Slaughtered in Wukari, Southern Taraba State, Nigeria. Advances in Preventive Medicine. 2019; 2019: 2671620. 5p. DOI: 10.1155/2019/2671620

Sophy N, Makgadi PM, Masawenkosi I, Sithole, Philile I, Ngcamphalala, I.N, Danisile T, Innocent S.N. Infection rate of Fasciola species in cattle slaughtered at 13 abattoirs in six of nine provinces of south Africa. Food and waterborne parasitology. 2025; 39, e00260, https://doi.org/10.1016/j.fawpar.2025.e00260.

Usman MI. Studies on the prevalence of fasciolosis among ruminant animals in northern Bauchi state, north-easthern Nigeria. Parasite epidemiology and control. 2019; 5. e00090.https://doi.org/10.1016/j.parepi.2019.e00090.

World Health Organization. Food-borne trematode infections: Fasciolosis epidemiology 2019d.https://www.who.int/foodborne_trematode_infections/fasciolosis/fasciolosis_epidemiology/en/

World Health Organization. Neglected tropical diseases: Fasciolosis-infection with the neglected worms. 2019b. https://www.who.int/neglecteddiseases/integrated_media/integrated_media_fasciolosis/en/

Yatswako S, Alhaji NB. Survey of bovine fasciolosis burdens in trade cattle slaughtered at abattoirs in north-Central Nigeria: The associated predisposing factors and economic implication. Parasite Epidemiology and Control. 2017; 2: 30-9.

***Corresponding author's email ID:** modugoni2228@gmail.com

Citation: Modu KA, Tijjani B, Abubakar M, Malah M, Gambo A, Dawud S, Hussaini S, Balbaya AI, Bole YM. A Retrospective Study of Zoonotic Fasciolosis in Slaughtered Food Animals at Damaturu Modern Abattoir, Yobe State, Nigeria: Implications for Public Health and One Health Interventions. Indian Journal of Veterinary Public Health. 2025; 11(2): 65-71.

DOI: https://www.doi.org/10.62418/ijvph.11.2.2025.65-71