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## Prevalence of Liver Fluke (*Fasciola hepatica*) in Sheep and Goats Slaughtered at Katsina Central Abattoir, Katsina State, Nigeria

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### Abstract

This study was carried out to determine the prevalence of Liver fluke (*Fasciola hepatica*) in sheep and goats slaughtered at Katsina Central Abattoir, Katsina State. A total of One hundred and fifty (150) bile samples comprising of seventy five (75) from sheep and seventy five (75) from goats were collected at daily intervals for a period of four weeks. The bile samples were analysed using sedimentation technique to determine the presence of Liver fluke (*Fasciola hepatica*). Results revealed the prevalence of Liver fluke infection in sheep as 19.35% in male and 25% in female, while in goat; the prevalence was 18.51% in male and 14.58% in female respectively. In relation to age in sheep, those within the age range of 5-9 months had the highest prevalence (9.33%) and in goat, those within the age range of 10-14 months had the highest prevalence (6.66%). There were no significant statistical associations ( $p>0.05$ ) between infection of *Fasciola hepatica* and sex, as well as age in both sheep and goats slaughtered at Katsina Central abattoir during the period of this study. There is the need for preventive measures to be taken by the government, herds men and other stakeholders in order to prevent damages caused by Liver fluke in sheep and goats bred in the study area.

**Keywords:** Prevalence, Liver fluke, Abattoir, Slaughter, Sheep, Goat

### INTRODUCTION

*Fasciola hepatica*, also known as Liver fluke or sheep liver fluke, is an economically important snail-borne parasitic trematode of the genus *Fasciola* and phylum Platyhelminthes (Kantzoura *et al.*, 2011). The liver flukes are recognised as one of the most important ruminant helminthic parasites which are found in many parts of the world (Massoud *et al.*, 2012). They infect the liver of various animals including man, causing a parasitic zoonosis called fasciolosis, a disease classified among the neglected tropical diseases (Young *et al.*, 2011). The principal definitive hosts of these parasites are cattle, sheep, and goat. However, certain other mammals, including humans, may be infected as an accidental host (McCann *et al.*, 2010).

In Nigeria parasitological studies have shown that helminthes infection in cattle take place at certain times of the year (a month prior to start of the rain and a month after rainy season) (Young *et al.*, 2011). The trans- human system which involves movement of animals to areas of wet regions during the dry season, when the grass for grazing becomes scarce encourages the spread of these liver flukes as a result of the eggs being passed out in faeces as the animals graze (Alasaad *et al.*, 2011). Liver flukes infections in animals may result to huge economic loss associated with decreased

productivity, loss of weight, poor carcass quality, cost of antihelminthic treatment and condemnation of offal, particularly the liver at slaughter (Ozung *et al.*, 2011). Liver fluke infection may also pose other public health concerns as the infective forms of these helminthes (metacercaria) may be found on the surface of water and on vegetables through the use of manure produced from already contaminated faeces.

Many studies on *Fasciola* parasites were conducted in Nigeria for instance; Ulayi *et al.*, (2007); Ozung *et al.*, (2011); Muhammad and Elkanna (2015) ; Rafindadi and Yusuf (2015) as well as IrfanUllah *et al.*, (2016). However, little is known and documented on prevalence of *Fasciola hepatica* infections from Katsina Central Abattoir which is the largest and most visited abattoir in Katsina State. The aim of this study therefore was to determine the prevalence of Liver fluke (*Fasciola hepatica*) in sheep and goats slaughtered at Katsina Central Abattoir, Katsina state.

### MATERIALS AND METHODS

#### Study Area

The study was carried out at Katsina Central Abattoir, Katsina State, which is situated opposite Katsina Central Market, along Dutsinma road, Katsina State. Katsina town is located approximately between latitude 12° 58'13"N and longitude 7° 35'43"E.

### Sample Collection

One hundred and Fifty (150) bile samples comprising of seventy five (75) biles from sheep and seventy five (75) from goats were randomly collected from the abattoir on daily basis for a period of one month (from June to July 2018). Immediately after slaughtering the animals, the bile samples were collected and covered in sterile containers as described by Tylor in 1964 (Schweger, 2008). They were labelled accordingly based on sex and age and immediately taken to the Biology Department Laboratory of Umaru Musa Yar'adua University Katsina for further analysis.

### Parasite Identification

To detect the presence of liver fluke (*F. hepatica*) in the collected samples, sedimentation method was used as described by Tylor in 1964 (Schweger, 2008). Each bile sample was rinsed with normal saline and cut with a sterile scissors. The contents were poured into sterile test tubes arranged in a test tube rack and labelled accordingly. Normal saline was dropped into each sample for preservation and left to stand for 24 hours. After 24 hours, the supernatant was poured

away, leaving the sediment. The sediment was pipetted using a Pasteur pipette and smeared on a clean slide. It was examined under the microscope using a lower magnification of X10. The process was repeated for all the samples and the results were recorded accordingly.

### Statistical Analysis

Descriptive statistics were used to find out the percentages of prevalence and chi-square analysis was used to determine the prevalence of the parasite in relation to sex and age in both sheep and goat. Confidence level of  $P \leq 0.05$  was considered significant and used for the analysis.

## RESULTS

### Overall prevalence of *F. Hepatica* (Liver fluke) in sheep and goats

Table 1 shows Overall prevalence of *F. hepatica* (Liver fluke) in sheep and goats slaughtered at Katsina Central Abattoir. Out of Seventy five (75) sheep examined 17 (22.67%) were found to be infected with *F. hepatica*. The sheep were more infected than the goat which have an infection of 12 (16.0%).

**Table 1:** Overall prevalence of *Fasciola hepatica* in sheep and goats slaughtered at Katsina Central Abattoir.

Animals	No. Examined	No. Infected (%)	No. Non infected (%)
Sheep	75	17 (22.67)	58 (77.33)
Goat	75	12 (16.00)	63 (84)
<b>Total</b>	<b>150</b>	<b>29 (19.33)</b>	<b>121 (80.67)</b>

### The prevalence of *F. hepatica* among sheep in relation to sex

The prevalence of *F. hepatica* among sheep in relation to sex is shown in Table 2. Thirty one (31) males were examined and 6 (19.35%) were

infected and forty four (44) females were examined and 11 (25%) were infected. There was no statistical significant association between sex and prevalence among the sheep examined ( $\chi^2 = 0.087$ ,  $df = 1$ ,  $P = 0.7680$ ).

**Table 2:** Prevalence of *F. hepatica* infection in relation to sex in sheep from Katsina Central Abattoir.

Gender	No. of sheep exam.	No. Infected (%)	No. non infected (%)
Male	31	6 (19.35)	25 (80.65)
Female	44	11 (25)	33 (75)
<b>Total</b>	<b>75</b>	<b>17 (22.67)</b>	<b>58 (77.33)</b>

Similarly, no significant association / relation was observed between prevalence and sex in goat examined for *F. hepatica* from Katsina Central Abattoir (Table 3) ( $\chi^2 = 0.1395$ ,  $df = 1$ ,  $P = 0.9060$ )

**Table 3:** Prevalence of *Fasciola hepatica* infection in relation to sex in goats from Katsina Central Abattoir.

Gender	No. of goats exam.	No. Infected (%)	No. non infected (%)
Male	27	5 (18.51)	22 (81.48)
Female	48	7 (14.58)	41 (54.66)
<b>Total</b>	<b>75</b>	<b>12 (16)</b>	<b>63 (84)</b>

**Prevalence of *F. hepatica* in relation to age in sheep**

Prevalence of *F. hepatica* in relation to age in sheep is shown in Table 4. Age group 5-9 (9.33%) has the highest infection followed by age group 10-14 (6.66%) and the least infected

age group in sheep was age group 20-24 (1.33%). Similarly, no statistical significant association / relation was observed between prevalence and age in sheep examined for *F. hepatica* from Katsina Central Abattoir

**Table 4:** Prevalence of *Fasciola hepatica* infection in relation to age in sheep from Katsina Central Abattoir.

Age (months)	No. of sheep exam.	No. Infected (%)	No. non infected (%)
0-4	12	2(2.66)	10(13.33)
5-9	20	7(9.33)	13(17.33)
10-14	29	5(6.66)	24(32)
15-19	8	2(2.66)	6(8)
20-24	6	1(1.33)	5(6.66)
<b>Total</b>	<b>75</b>	<b>17(22.64)</b>	<b>58(77.32)</b>

**Prevalence of *F. hepatica* in relation to age in goat**

Age groups 0-4 months and 15-19 months were least infected with *F. hepatica* in goat (Table 5). Age group 10-14 months were highly

infected than the other age groups. There was no significant statistical association between prevalence and age among the goat examined ( $\chi^2 = 2.803$ ,  $df = 4$ ,  $P = 0.5913$ ).

**Table 5:** Prevalence of *Fasciola hepatica* infection in relation to Age in goat from Katsina Central Abattoir.

Age (months)	No. of Goats exam.	No. Infected (%)	No. non infected (%)
0-4	3	1(1.33)	2(2.66)
5-9	26	2(2.66)	24(32)
10-14	28	5(6.66)	23(30.66)
15-19	6	1(1.33)	5(6.66)
20-24	12	3(4)	9(12)
<b>Total</b>	<b>75</b>	<b>12(16)</b>	<b>63(38.98)</b>

**DISCUSSION**

The prevalence of *Fasciola hepatica* (Liver fluke) may depends on several factors such as source of infection in that area, availability of intermediate host, environmental conditions that favour the growth of intermediate host (snail) and its interaction with the final host that might suffer from the disease.

The prevalence of *F. hepatica* observed in sheep and goats in this study showed that prevalence in sheep is higher as compared to the prevalence in goat. The finding of this study agreed with that of Rafindadi and Yusuf, (2005) who recorded higher prevalence of *F. hepatica* in sheep than in goat from Zaria abattoir Nigeria. This might be due to more susceptibility of sheep to the infection because the sheep herds are mostly nomadic, they move from one place to another depending on the availability of grass to graze on, and water which also increases their risk. The overall prevalence of *F. hepatica* in sheep and goat recorded in this study is comparatively lower than that reported by Ulayi *e t al.*, (2007) in Zaria. Generally, the prevalence of *F. hepatica* among sheep and goats recorded in this

research might be attributed to the climatic conditions of this location which does not favour the survival of the intermediate hosts, the snail. This intermediate host prefers swampy areas with slowly moving water and small streams which allows sufficient moisture for the survival of the infective metacercariae. In contrast, the study area, Katsina State, occupies low flat and naturally dry land (semi - arid areas). This probably explains the low percentage of infection with *F. hepatica* among sheep and goats slaughtered in the abattoir.

In this study, the prevalence of *F. hepatica* infection recorded was higher in female than in male (in both sheep and goats) this agreed with the findings of Bhutto *e t al.*, (2002) who found a slightly higher prevalence of helminths in female calves than male calves in Pakistan. This finding also concurred well with the finding of Maqbool *e t al.*, (2005) who reported higher prevalence in female sheep than male in Pakistan, but disagreed with the results of Selim *e t al.*, (2007) who reported higher prevalence of *F. hepatica* in males than females in Black Bengal goats from Bangladesh.

This disparity in susceptibility to the infection between the two sexes might be attributed to the differences in the host intrinsic factors (genetics, physiology, and immunology) and extrinsic factors (environment and management practices). The infection rate observed based on age showed differences between different age groups which were not statistically significant. This finding was in agreement with finding of Fryod (1975) who reported higher prevalence of *F. hepatica* in adults stocks more than the young stocks from Great Britain and Assanji (1988) who reported lower prevalence of *F. hepatica* in younger and adult sheep as compared to aged sheep. These findings are also in close agreement to the previous findings of Ahmad *et al.*, (2007), who found significant differences in *F. hepatica* infections between different age groups in sheep in the middle awash River Basin, Ethiopia. This difference is probably due to high acquired immunity which increases in young and adults sheep and goats.

#### CONCLUSION

This study has revealed that *F. hepatica* infection is prevalent among sheep and goats slaughtered at Katsina Central Abattoir, Katsina State. It has also indicated that factors such as ages and sexes of the animals were found to be related with the prevalence of the diseases

#### REFERENCES

- Ahmad E.F, Markvichtr K, Tumwasorn S, Koonawootrittriron S, Choothesa A. and Jittapalapony S. (2007) Prevalence of Fasciola sp. Infections of sheep in the middle awash River Basin, Ethiopia. *Southeast Asian journal for tropical medical Public Health*, 3(8):51-57.
- Alasaad S, Soriguer R.C, Abu-madi M, El Behairy A, Jowers M.J, Banos P.D, and TaqMan H.P. (2011) Real-time PCR-based assay for the identification of Fasciola spp. *Veterinary Parasitology*, 179(3):266-271.
- Assanji F.M. Helminth infection in livestock. (1988) *Journal of Helminthology*, 62(10):243-249.
- Bhutto B, PhullanM.S, Rind R. and Soomro A.H. (2002) Prevalence of gastrointestinal helminths in buffalo calves. *Online Biological Science*, 8(2):43-45.
- Fryod G. (1975) Liver Fluke infection Great Britain. *A survey of affected livers Veterinary Record*, 9(7): 492-495.
- IrfanUllah M, Farrukh N, Ahmad A.K, Jadoon A and Sobia T. ( 2016) Prevalence of *Fasciola hepatica* in domesticated cattle of district Karak, Khyber

even though these were not proved statistically.

#### RECOMMENDATION(S)

Based on the findings of this study, it is recommended that:

- I. More preventive and curative measures should be taken by the government and other stake holders to prevent future and higher prevalence of the diseases.
- II. Better animal husbandry should be encouraged among sheep and goat farmers and herd men which include regular veterinary inspection and deworming by the government to reduce the prevalence of *F. hepatica* on sheep and goats slaughtered at Katsina Central Abattoir and other parts of the State.
- III. Further research is recommended in order to provide up to date information on the prevalence of *F. hepatica* on sheep and goats slaughtered at Katsina Central Abattoir.

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Pakhtunkhwa, Pakistan. *Asian Journal of Animal Sciences*, 8(10): 85-91.

Kantzoura V, Kouam MK, Fieldas H, Teofanova D, Theodoropoulos G. (2011) Geographical distribution modelling for ruminant liver flukes (*Fasciola hepatica*) in south eastern Europe. *International Journal Aprasitology*, 41 (7): 747-753.

McCann C.M, Boylis,M. And Williams D. J. (2010), the development of linear regression models using environmental variables to explain the spatial distribution of *Fasciola hepatica* infection in dairy herds in England and Wales. *International Journal of Parasitology*. 40 (4): 354-361.

Maqbool A, Hashmi H.A, Shafique M, Tanveer A, Ahmad M and Mahmood F.(2005) Epidemiology and Chemotheraphy of Fasciolosis in goats. *Indian Journal Animal Research*, 3(4):33-36.

Massoud A.M, Shalaby H.A, El Khattab R.M, Mahmoud M.S, Kutkat M.A. (2012) Effects of mirazid and Myrid Volatile oil on adult Fasciola gigantica under laboratory conditions. *Asian Journal for Tropical Biomedicine*, 2(11): 875-884.

- Muhammad S.T, and Elkanna O.S. (2015). Preliminary studies on fasciolosis in cattle slaughtered at Jalingo Abattior, Taraba State. *Nigerian Journal of Science, Technology and Environmental Education*, 7(3): 143-146.
- Ozung P.O, Owai P.U and Oni K.O. (2011) An assessment of the prevalence of Fasciolosis of Ruminants in Ikom Abattoir of Cross River State, Nigeria. *Continental Journal of Veterinary sciences* 7(5):1-5.
- Rafindadi, M.N and Yusuf, Z.H. (2015) Prevalence of liver fluke in sheep and goats slaughtered at Abattoirs in Zaria, Kaduna state. Nigeria. *International journal of health and medical information*, 4(3): 2150-2350.
- Weger, F. (2008). *Parasites and infectious disease discovery by serendity* Cambridge University Press.
- Selim M, Sen M.M. and Rahman A. (2007) An abattoir survey on the liver diseases of Black Bengal goats, Bangledash. *Veterinary journal* 7(31): 113-114.
- Ulayi B.M, Umaru- S. B. and Adamu S. (2007) Prevalence of *Dicrocoelium* and *Fasciola* spp infections in cattle slaughtered in Zaria, Nigeria. *Journal of animal and veterinary advances*, 9(11): 12-1115.
- Young N.D, Jex A.R, Cantacessi C, Hall, R.S, Cambell B.E, Spithill T.W, Tangkwattana, P. and Lala, T. (2011) A Portrait of the transcripome of the neglected trematode. *Fasciola gigantica* - *Biological and Biotechnological implications*. 5(2):43-44.