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Prevalence of Bovine Fasciolosis in Gechi District, Buno Bedelle Zone, South West Ethiopia

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Abstract: *Fasciolosis is an economically important parasitic disease of cattle in Ethiopia. The aim of study was to determine the prevalence of fasciolosis in cattle A cross-sectional survey was carried out from July 2015 to October 2015 on bovine fasciolosis in Gechi district, Buno Bedlele Zone of Oromia Regional state at south western part of Ethiopia. For this, a total of 384 feacal samples were randomly collected from local breed cattle and all samples were subjected to standard sedimentation test at Animal Health laboratory of Bedele regional station; Oromia, Ethiopia. In the laboratory coproscopic examination were performed to detect the presence of Fasciola egg. Fresh fecal samples for parasitological examination were collected directly from the rectum by using disposable plastic gloves and placed in clean screw capped universal bottles. Each sample was labeled with date of submission, age, sex, body condition and place of origin (PAs). Samples were preserved with 10% formalin solution. The overall prevalence of bovine fasciolosis was found to be 23.7% from 91 positive samples. From the various risk factor analyzed, age categories of cattle, sex, body conditions and PAs influence were found to be non-significantly associated ($p>0.05$) with the prevalence of bovine fasciolosis. When considered the relationship with sex it was observed that male (23.40%) and female (23.97%), in young age (23.72%) and adult (23.68%). As regards to body condition, poor (23.75%) and good (23.66%) was recorded; and the prevalence was varying among PAs that is lower (23.07%) and higher (24.44%) in different PAs of the study area. It can be concluded that these risk factors need to be taken in consideration when designing effective fasciolosis control management system for cattle in Ethiopia.*

Keywords: *Prevalence, Gechi district, Bovine, Fasciolosis.*

1. INTRODUCTION

Livestock is an important component of farming system in Ethiopia and provides drought power milk, meat, manure, hides, skin and other products (Funk, *et al.*, 2012).Currently the population of livestock found in Ethiopia estimated to be 55.4 million cattle, 26.5 million sheep and 23.78 million goats (CSA, 2011). Although Ethiopia has substation livestock resources level of productivity is low due to constraint of Disease. Out of these disease *Fasciolosis*is major disease which is imposes direct and indirect economic impact on livestock production particularly on the sheep and cattle (Keyyu *et al*., 2005, Menkir *et al*., 2007).

Bovine *Fasciolosis*is an economically important parasite disease of cattle caused by *Fasciolidae* family *trematode* of Genus *Fasciola*, the two important species of Genus, *Faciola hepatica* and *Faciola gigantica* are commonly known as liver fluke. Generally *Fasciolosis* is a worldwide distribution however, the distribution of *Fasciola hepatica* is wide spread temperate area and tropical high land of Africa (Urquhart *et al.*, 1996).

The epidemiology of *Fasciolosis*is depends on the ecology of snail's intermediate host. There are many different species of *lymnea* but now generally agreed that two snail types are involved in the transmission of fluke, although there are species variation different countries.

In case of *Fasciola* hepatica the most known intermediate host *Lymneatrancatula* of mud snail which prefers moist temperature condition (15^0C-22^0C), although it appears variants found in the tropic have

adapted to higher temperature and can be breed and survive at 26^0C with sufficient moisture during the dry season. *Lymneatrancatula* capable of aestivation or at least years a dry mud (Miodrag and LanMclntye, 1996).

The Intermediate host for *Fasciolagigantica* is of the *Lymneaauricularia* type. These are aquatic snail which prefers tropical or subtropical condition and thrive in well Oxygenated non polluted water. *Fasciolosis*is a cosmopolitans diseases and the parasite having complex life cycle involving various *lymnea* species amphibians and aquatic snail as an intermediate.

Infection occurs where livestock graze the habitat of snail especially in ditches marshy area. Edge of water channels flood Plains (Archi, 1994).

*Fasciolosis*is a serious problem in Ethiopia highland cattle raising are major to local economy (Kifle, 1998).

Apart from its veterinary and economic important throughout the world, *Fasciolosis*has recently been shown to be are–emerging and wide spread *zoonosis* affecting people (Estaban *et al*., 2003)

In some part of our country study conduct by Abduljabar (1992), Daniel (1995), Tolosa and Worku (1997), total economic loss showed about a total loss 154188,215000, 54063.34 Ethiopian birr per year in cattle were reported due to *Fasciolosis* at Ziway, Dire Dawa and Jimma Municipality slaughter houses respectively. Ilubabor is one of the potential areas in livestock Population but due to disease prevalence, the production and productivity is very low.

According to their economic importance of different animals disease that have been and still inflicting much damage to the livestock sector: T*rypanosomiasis*, internal parasite, infectious diseases, external parasite and commonly disease affecting cattle and other animals in the area. Among the internal parasite disease, *Fasciolosis* locally called 'bale' is the one which affecting cattle and other ruminants (Gechi Livestock development and Health Agency, 2015).

But, studies on the epidemiology of fasciolosis in cattle were not so far conducted in Gechi Woreda district of Oromia regional state and it was the rational that initiated this research project.Therefore, the objective of this study was:-

- To determine the prevalence of bovine fasciolosis in the study area.

2. MATERIAL AND METHOD

2.1. Study Area

The Study was conducting from July 2015 up to end of October 2015 in buno beddelle Zone of Oromia Regional state at western part of Ethiopia in Gechi Woreda. Gechi is located at 138 Km from Mettu town, which is the capital city of Ilu Ababora Zone, 120 Km from Jimma town and 124 Km from Nekemte town.

The woreda situated at latitude of 816 4800N and Longitude of 36 34 1200E at elevation of ranging from 140- 297 m.a.s.l the study area received mean annual rain fall with an average of 1639.5 ml. the woreda has different climatic classification which includes highland (Dega) 27%, Midland (Weyna Dega) 50% and Lowland (Kola) 23% and with regard land coverage, marshy area share about 2495 hectare of the total area, which is 48,652.7 hectare (Gechi woreda Agricultural Office, 2015).

2.2. Study Population

Study population includes local breeds of cattle; managed under traditional management system. There are a total numbers of 76,122 cattle in the Gechi woreda. From this total numbers of cattle, 384 were examined (from Chara, Haro, Mucha and Chobtu) in Gechi woreda. Totally to determine the prevalence of bovine *Fasciolosis* in Gechi, 384 cattle were randomly selected.

2.3. Study Design

The cross sectional study was designed with the objective to determine the prevalence of *bovine Fasciolosis* in Gechi district.

2.4. Sample Size Determination and Sampling Method

The animals were selected by using simple random sampling method to determine the sample size; an expected prevalence of 50% was taken in to consideration since there was no earlier *coprological*

research work on *Fasciolosis* in the area. Therefore, the four peasant associations (PAs), District and individual cattle in the PAs were selected by simple random sampling technique from study area (Gechi woreda). The desired sample size for the study was calculated using the formula given by Thrus field (1995) with 95% confidence interval and at 5% Absolute precision.

$$n=1.96^2 * Pexp\ (1-Pexp)/d^2$$

Where, n= required sample size

pexp = Expected prevalence

d= Absolute precision

Totally, 384 cattle were randomly sampled in Gechi to determine the prevalence rate.

2.5. Fecal Sample Collection and Laboratory Techniques

In the laboratory *coproscopic* examination were performed to detect the presence of *Fasciola* egg, according to standard technique as described by Hasen and Perry (1994). Fresh fecal samples for *parasitological* examination were collected directly from the rectum by using disposable plastic gloves and placed in clean screw capped universal bottles. Each sample was labeled with date of submission, age, sex, body condition and place of origin (kebele). Samples were preserved with 10% formalin solution to avoid the eggs development and hatching for laboratory diagnosis, then transported to Bedelle regional laboratory for detail *coproscopic* examination.

2.6. Data Management and Analysis

All Data generated from study were entered in to Microsoft Excel data system. The data were thoroughly screened for errors and properly coded before subjecting to statistical analysis. The Data were imported from the Microsoft excel and analyzed using STATA software 11.0 computer to determine the variation in infection prevalence in potential risk factor (Age, Sex, Pas and Body condition). Significances were considered with the "P" value less than 0.05.

3. RESULTS

Out of 384 fecal sample examined an overall prevalence of 91 (23.7%) were found positive for fasciolosis in the study area.

Table1. *Coprological Prevalence of bovine Fasciolosis in Gechi District*

PAs	No of examined Cattle	No of Positive	Prevalence (%)	P-Value	(95%) CI
Chara	97	23	23.71		0.801-1.211
Haro	90	22	24.44	0.886	
Chobtu	93	22	23.65		
Mucha	104	24	23.07		
Total	384	91	23.7		

Out of 384 cattle examined for the prevalence of bovine *Fasciolosis* in Gechi, 91(23.7%) cattle were found to be positive for *Fasciolosis*. The higher prevalence was recorded in Haro PAs (24.44%) and lower prevalence was in Mucha PAs (23.07). Statistical analysis showed that no significance ($P > 0.05$) difference between PAs.

Table2. *Prevalence of bovine Fasciolosis based on age group*

Age	No of examined	No of Positive	Prevalence (%)	P-Value	(95%) CI
Young	118	28	23.72	0.999	0.843 --1.185
Adult	266	63	23.68		
Total	384	91	23.7		

During the study period cattle were classified based on their age (1-3 years) young and (> 3 years) adult. Based on this classification of animals in Age, prevalence of bovine Fasciolosis was studied in Gechi. From 118 examined young (1-3 years) cattle about 28 (23.72%) cattle was positive of *Fasciolosis* and among the 266 examined adult (>3 years) cattle 63 (23.68%) of them were positive for *Fasciolosis* with an overall prevalence of 23.7%. statistical analysis revealed that there is no significance difference ($P > 0.05$) in prevalence between the age group (Table 4).

Table3. *Prevalence of Bovine Fasciolosis based on Sex groups*

Sex	No of examined	No of Positive	Prevalence (%)	P-Value	(95%) CI
Male	188	44	23.40	0.893	0.644—1.654
Female	196	47	23.97		
Total	384	91	23.7		

From the total numbers of 384 randomly selected cattle 188 of them were male, from which 44 23.40%) of them were positive for *Fasciolosis* and 196 them were female, from which 47 (23.97%) of them were positive for *Fasciolosis*. Statistical analysis showed that no significance ($P > 0.05$) difference in prevalence between the Sex group as indicated in the above table (table 5).

Table4. *Prevalence of Bovine Fasciolosis based on body condition*

Body condition	No of examined	No of Positive	Prevalence (%)	P-Value	(95%) CI
Poor	160	38	23.75	0.987	0.617—1.606
Good	224	53	23.66		
Total	384	91	23.7		

From 160 examined poor body condition cattle, about 38 (23.75%) cattle were positive for *Fasciolosis* and among of 224 examined good body condition cattle 53 (22.66%) of them were positive for *Fasciolosis*. Statistical analysis showed that no significance ($P > 0.05$) difference in prevalence between body condition score. Body condition score standard indicated

4. DISCUSSION

The present study provides the prevalence data on bovine *Fasciolosis* in Gechi district. Out of 384 feacal samples analyzed 91 (23.7%) found to be positive using sedimentation technique as diagnostic method. The Previous studies conducted in different part of Ethiopia by Fekadu (1988) 62.2% in Bahirdar, Yadeta (1994) 81.6% in Ambo, Adem (1994) 56.6% in Zeway, Rahmeto (1992) 34% in Walliso, Yohannis (1994) 61.79% in Gojjam and other revealed a much higher prevalence rate which disagree with the present finding 91 (23.7%).This difference in prevalence of *Fasciolosis* in Ethiopia may be related with difference in ecological factor available for snail intermediate host. The occurrence of *Fasciolosis* in the area is influenced by a multi factorial system, which comprises, host parasite and environmental effect. In the natural foci of *Fasciolosis*, the *Fasciola* and their intermediate and final hosts form an association possessing a potential epidemiological threat (Maqbool *et al.,* 2002).

The 23.7% prevalence of bovine *Fasciolosis* found in this study is agree with (22.72%) prevalence of bovine *Fasciolosis* reported at Nekemte by Wassie (1995) using abattoir and less or more agrees with the previous report (24.32%) in Mekele area (Gebretsadik *et a*l., 2010). The likely explanation may be cattle in study area graze in the same communal grazing land with similar agro ecological condition. So that the chance of acquiring the disease or becoming of infected is similar between early released of young stock with adult.

Infection rate of bovine fasciolosis of the result of the study indicated that the prevalence of poor body condition (23.75%) and good body condition (23.66%) revealed that infection rate has no significant difference ($p > 0.05$) on the prevalence of fasciolosis. The study done in northern Ethiopia by Solomon (2005) indicates that there is no significance difference association ($P > 0.05$) between body condition of animals and this result agree with the result obtained from this study .In addition, study done by Marta (2008) indicated that there was no significance difference between age, sex and PAs and this result also agree with present study.

The prevalence of the current study in male and female animals was recorded as 23.40% and 23.97% respectively. There was non-significant difference ($p > 0.05$) between the two sexes indicating that sex seems no effect on the prevalence of the disease. Similar results have been reported by Grabber and Dans (1974), Kifle (1998).This may be due to the fact that grazing of both sex groups in similar pasture.

The prevalence of the disease in different PAs of the study areas were very closely similar having chara (23.71%), Haro (24.44%), Chobtu (23.65%) and Mucha (23.07%) with non-statistical difference ($p > 0.05$) this non-significant difference indicate that there is no difference in prevalence of the disease.

In present study, the risk of infection to all age groups was the same. The young and adult cattle have the same risk of infection similar risk of infection could be due to the fact that both young and adult cattle were forced to graze on the same pasture. This corroborates with other previous findings (Phiri *et al*., 2005)

Therefore, this study showed that there was no significance association (P > 0.05) between the prevalence, with age, sex, PAs and body condition in study area.

5. Conclusion And Recommendations

The present study shows that prevalence of 23.7% of *bovine Fasciolosis* in Buno Bedelle Zone. Therefore, it is possible to conclude that *Fasciolosis*is was found less prevalent in the study area, even though, the prevalence is low it should not be neglected. That means it needs attention both from livestock owners and the Veterinarian in the study area. The following few points of recommendations were forwarded

- Awareness should be created among farmers about disease transmission.
- Drainage of stagnant water in swamp areas should be carried out.
- Regular deworming program before and after the rainy season should be done.
- Finally, combinations of control measures including drainage, grazing management, and regular deworming have to be used to insure satisfactory degree of control.

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