

## Prevalence of Bovine Fasciolosis in Wera Jarsoworeda, North Shoa Zone, Oromia Regional State

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**Abstract:** Cross sectional study by using simple random sampling was conducted from June 2014 to December 2014 in Wera Jarso Woreda with the aim of determining the prevalence of bovine fasciolosis. Accordingly 384 cattle were examined coprologically using sedimentation technique. The total prevalence of 25% (n=96) with higher prevalence in high land 36.0% and poor body conditioned animals (38.1%) were recorded. Risk factors showed significant difference between body condition scores with (p-value 0.046 and  $X^2=16.57$ ). From the result obtained in this study it can be concluded that bovine fasciolosis is economically important disease which warrants control and prevention measures.

**Key words:** Bovine • Coprological • Fasciolosis • Fecal Sample • Prevalence • Wera Jarso

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### INTRODUCTION

The agricultural sector, in Ethiopia, is characterized largely by mixed farming system in which livestock play the vital role in the farming system of the country by giving draft power supply for crop production, as a source of meat, milk and cash income [2]. According to Central Statics Agency [1] estimate the livestock population is about 30 million heads of cattle, 24 million sheep, 18 million goats, 7 million equines, 1.25 million swine and 55.6 million poultry. The Ethiopia livestock contributes only 15% of the Gross Domestic Product. Cattle are the prime for the country's economy [1]. However the occurrence of diseases and parasites are the major contributing factors that have impeded the full exploitation of cattle potential [3].

Agricultural production that depends on both animal rearing and crop production is severely affected by ecological conditions, climatic conditions and geographical situation in the winter. When there is shortage of water, feed animals are forced to graze near

and around streams, ponds, springs, lakeshores, river banks and irrigation that results in high incidence and spread of common water born animal diseases such as fasciolosis, which is known to cause a significant economic losses [4].

Fasciolosis is caused by *Fasciola hepatica* and *Fasciola gigantica*. It is one of the most prevalent helminth infections of ruminants in different parts of the world including Ethiopia. It causes significant morbidity and mortality [5, 6]. The economic significance of fasciolosis in high lands of Ethiopia has been reported by several works [7, 8].

Both types of liver fluke cause severe losses in many parts of Ethiopia, in which suitable ecological conditions are found for the growth and multiplication of intermediate hosts. Snails are found in areas with flooded pasture grazing, lake shores, rivers, streams, ponds, springs, marshy areas, wet mud's, half marks following heavy rain fall and water ways. This is study was conducted to determine the prevalence of bovine fasciolosis through Coprological examination in weraJarsoWoreda.

## MATERIALS AND METHODS

**Study Area:** The study was conducted in Were Jarso Wereda which is found in Oromia regional state, North Shoa zone, at a distance of 186 km from Addis Ababa and 76 km from zonal city Fiche. The Wereda has a total area of 119, 835 hectare out of which 38, 040 hectare Agricultural, 15, 516 hectare forest land, 24, 622 hectare mountain land, 30, 655 hectare Grazing land and 11, 002 hectare for construction. The area under the study has a range of altitude between 1000m-2250m above sea level. Agro ecologically the Wereda is categorized as 49.5% high land, 43.37% mid land and 7.13% low land and has a bimodal rain fall. According to (WJEB, 2004) the woreda have a total livestock of 251517 of which 102, 317 Cattle, 32, 317 Sheep, 28, 726 Goats, 195 Mule, 928 Horse, 13, 923 Donkey, 73, 111 poultry.

**Study Population:** The study was conducted on 384 heads Cattle brought from different kebeles of the Woreda.

**Size Determination:** The sample size was determined by taking 50% prevalence of fasciolosis and using the formula given by Thrusfield [9] since there is no available/published data at the woreda.

$$n = \frac{1.96^2 \cdot p_{exp} (1-p_{exp})}{d^2}$$

where,

n = required sample size

$p_{exp}$  = expected prevalence

d = desired absolute precision

hence,  $d = 5\% (0.05)$

$p = 50\% (0.5\%)$

**Study Methodology:** A simple random sampling technique was used for determination of prevalence of bovine fasciolosis by fecal examination on the live animals.

## Study Design

**Corpological Examination:** Three gm of each fecal sample were putted in to a mortar and crushed through with pistil then 42 ml of tape water were poured on it and mixed. The suspension was centrifuged at 1500 rpm for 2 minute. After centrifugation supernatant was removed carefully and the left sediment was resuspended again into 15ml of water then allowed for five minute to sediment. After supernatant carefully discarded, the sediment was stained using one drop of methylene blue. Finally drop of the stained sediment was transferred to a microscope slide and covered with cover slip to examine under microscope at 10x magnification [10].

**Statistical Analysis and Interpretation:** The data collected from the study (Sedimentation Technique) was recorded in the format developed for this purpose and later entered in to Microsoft excel 2007 program. All raw data generated from this study were coded and entered in MS Excel database system and analyzed Using SPSS version 20.0 computer program.

## RESULTS

From the total of 384 heads of cattle, the overall prevalence of bovine fasciolosis in the study area was 25 % (n=96). Out of them, 48 (30.0%) male and 48 (21.4%) female were found to be positive (Table 1).

From the total of 96 *Fasciola* positive animals the prevalence rate of 8.0 % (n=4), 24.0 % (n=38), 28.4 % (n=38) and 38.1 % (n=16) were recorded, respectively, with Very Good, Good, Poor, Very Poor body condition animals (Table 2).

The prevalence results in different origins showed that 36.0 % (n=64), 16.7 % (n=18) and 14.3% (n=14) were recorded in High, Mid and Low land areas, respectively.

The prevalence of 24.3 % (n=68) in adult and 26.9 % (26.9) in young were also recorded (Table 4).

Table 1: Prevalence associations of fasciolosis between sexes

Species	Sex	No of animals examined	No of animals infected	Prevalence (%)
Bovine	Male	160	48	30.00
	Female	224	48	21.42
	Total	384	96	25.00

Table 2: Comparison of bovine fasciolosis based on body conditions

Species	Body condition score	No. of animals examined	No. of animals infected	Prevalence (%)	p-value	X <sup>2</sup>
Bovine	Very Good	50	4	8	.046	16.57
	Good	158	38	24.05		
	Poor	134	38	28.36		
	Very Poor	42	16	38.10		
Total		384	96	25		

Table 3: Prevalence of bovine fasciolosis based on agro ecological (Origin) of animals

Species	Agro ecology	No of animals examined	No of animals infected	Prevalence (%)	p-value	X <sup>2</sup>
Bovine	High land	178	64	35.96	.450	14.97
	Mid land	108	18	16.67		
	Low land	98	14	14.29		
Total		384	96	25		

Table 4: Prevalence of bovine fasciolosis on the basis of age

Species	Age	No. of animals examined	No. of Animals infected	Prevalence (%)	p-value	X <sup>2</sup>
Bovine	Adult	280	68	24.29	.835	0.04
	Young	104	28	26.92		
	Total	384	96	25		

## DISCUSSIONS

The 25.0% prevalence of bovine fasciolosis in the current study was comparable with the work reported by Gebretsadik *et al.* [11] at Mekelle (24.32%) and it was significantly higher than the prevalence of bovine fasciolosis reported by Fufa *et al.* [12], at Welaita Sodo (12.7%) and Swai and Ulicky [13] at Hawi, Tanzania (14.05%), at Enango slaughter house. This might be attributed to the variation in agro-ecological conditions favorable to both the parasite and the intermediate host. Where, most of the high land in the Woreda had covered by large rivers & springs which were crowded by large number of cattle grazing daily. On the other hand, the prevalence of bovine fasciolosis in the present study was lower as compared with the previous reports in different parts of Ethiopia [14] at Jimma (46.58%) and Muluaem [15] in South Gondar (83.08%). The variation in climato-ecological conditions such as altitude, rainfall, temperature, livestock management system and suitability of the environment for survival and distribution of the parasite as well as the intermediate host might had played their own role in such differences. One of the most important factors that influenced the occurrence of fasciolosis in a certain area was availability of suitable snail habitat [16].

Relatively high level of bovine fasciolosis (26.92%) was observed in young group of animals. This finding agreed with the work of Hansen and Perry [17], Abebe [18] at Nekemt, Getu [19] and Hymanot [20] and Parr and Gray [21] in Ireland. This might be associated with the apparent inability of the host to develop acquired immunity, so that young animals have the heaviest infections and the highest prevalence. Adult cattle were likely exposed to frequent attack of fasciolosis and develop acquired resistance hence lower prevalence of bovine fasciolosis [16].

38.10% prevalence was recorded in very poor body condition animals, followed 28.39%, 24.05%, in poor and good body condition, respectively. This might be associated with immunity; poorly nourished animals appeared to be less competent in getting rid of infection although it was not unusual for well feed animals to succumb to the disease provided the right environmental conditions are made available [22].

The high prevalence (35.96%) recorded in high land followed by midland (16.67%) while the lowest prevalence (14.29%) was in low land. The disparity of prevalence might be associated similar reason with difference in study area as Graber [23] ecological conditions have considerable effect for breeding and survival of intermediate host snails and the parasite. The difference in prevalence might also be associated with the method of detection of *Fasciola* and the presence or absence other known or unknown concurrent disease prevalence in the study area. Different level of prevalence of bovine fasciolosis was recorded in the different study sites. Significant variation was not recorded with different age groups.

## CONCLUSIONS

In conclusion this study indicated that bovine fasciolosis was highly prevalent disease and result in low production of cattle in the study area and warrants appropriate treatment and control programs that involve the livestock owners and the government.

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**Conflicts of Interest:** Authors declares no conflicts of interest.

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