



## A Study on Prevalence of Ovine Fasciolosis in Busa Town, Dawo Woreda, South West Shoa Zone, Oromia Region

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**Abstract:** A cross-sectional study was conducted from June 2018 to November 2018 to determine the prevalence of ovine fasciolosis in Oromia region, South West Shoa, 285 fecal samples were randomly collected directly from the rectum of individual animals. Parasitological investigation was performed using sedimentation technique. From 285 coprologically examined sheep, 150 animals found positive for fasciolosis with an overall prevalence of 52.63%. Difference in prevalence rate observed among the three study sites from which the samples were collected. Hence, the prevalence rates recorded were 46.6% in Qarsa Galute 23.3% in Qarsabonbi and 30% BurqaGode. The difference in the prevalence in the three study sites was not statistically significant ( $p>0.05$ ). The prevalence of ovine fasciolosis was computed for the different age, sex and season categories. The prevalence rate of fasciolosis in young sheep 20% was less than in adults sheep 80% and the difference were not statistically significant ( $P>0.05$ ). The prevalence of fasciolosis in two sex groups in the present study was 66.66%, 33.33% in female and male respectively. The difference in the prevalence was not significant ( $p>0.05$ ). Seasonal prevalence of ovine fasciolosis the highest prevalence was recorded 33.3%, 20%, 16%, 14.6%, 9.3%, and 6.66%, during the months of in June, November, July, October, September and August respectively. The difference in monthly prevalence was significant ( $P<0.05$ ).

**Keywords:** Busa; Fasciolosis; Ovine; Prevalence

### 1. INTRODUCTION

Ethiopia possess the largest livestock population in Africa, with an estimated population of 7.8 million of equine, 1 million camels, 47 million cattle, 39.6 chickens, 26.1 million sheep, 21.7 goat (CSA, 2009). Small ruminants play a significant role in maintaining household stability by providing meat, milk, skin and religious roles (Alamyew, and Fletcher, 1995).

Among the small ruminants in Ethiopia, sheep are the dominant livestock, providing up to 63% of cash income and 23% the food subsistence value obtained from livestock production. Regardless of the large size of the sheep population in the country and the huge potential therein; the productivity per animal and the contribution of this sub sector to the national economy is relatively low due to multitude of constraining factors from this disease due fasciolosis is considered as one of the major parasitic problem that constrained livestock improvement and production programs in Ethiopia (Zelalem and Fletcher, 1991).

Fasciolosis is a serious parasitic disease mainly affecting cattle, sheep and rarely goat and equines (Urquhart, 1996). Fasciola are the large leaf shaped flukes that are commonly known as liver flukes, the high economic importance of fasciolosis is due to the predilection of the parasite in the liver of the host animals that has diverse metabolic activity and its function that depend up on its ability to perform specific metabolic function (Soulsby, 1998). Ovine fasciolosis was one of the major parasite diseases that inflict an enormous loss to sheep production on through mortality, reduction in weight gain, loss of meat and milk production in working power (Wassie, 1996).

Sheep, acute fasciolosis most often results in sudden death without other apparent clinical abnormality (Radostits *et al.*, 2007). Previous studies conducted in the central highlands of Ethiopia showed the significance and wide distribution of the infection (Bergeon, 1968; Scott and Goll, 1977; Erich, 1983). Found that the rate of infection was 90 % in Shoa and Gojam provinces, while (Gemechu and Mamo

1979) reported an overall prevalence of 63 % in cattle at different regionthe country and estimated the economic loss due to decreased productivity alone to roughly 350 million Ethiopian birr (140 million USD) per annum.

Fasciolosis has a high economic impaction tropical high lands and temperate climatic conditional in Africa and other Asia countries (Ogunrinade, 1980). There are the animal grazes on rangeland grazing postures during the early summer and late winter of the season of the year. In general,there is a high risk in summer (wetter) seasons of the year than winter season, in this seasons there is a high mortality in ovine and loss of productivity such as meats of infested animals by the disease (Wassie ,1996). The objective of the current study is prevalence of ovine fasciolosis was computed for the different three study site, age, sex and season categories. Therefore, the objective of this study was:

- To determine the overall prevalence of ovine fasciolosis and to assess the associated risk factors in the study area.

## **2. MATERIALS AND METHODS**

### **2.1. Study Area**

The study was conducted from June 2018 up to December 2018 in Dawo Woreda. Dawo Woreda is located in southwest part of Oromia Regional state; which is located 96 km from Addis Abeba and 51 km from zone central town. It has an annual average rainfall of 148mm and an annual average temperature 17.2°C. The topography and climatic condition of around Busa and its surrounding is suitable for livestock breeding (Office of Sabeta Veterinary Clinic and Laboratory). This area has a total lives stock population near to 98603 from these Bovine 23,499, Shoat 18500, horses 3609, mule 2115, donkey 13763 and poultry 532579 (Dawo Woreda Livestock and Fishery Office) and target animals were included in the study.

### **2.2. Study Population**

The study animals comprised of indigenous sheep of local breeds belonging to the three purposively selected villages of Busa namely Qarsa Galute, Qarsa Bonbi, and Burqa Gode, and consisting of various ages, sexes and season with regard to the prevalence of ovine fasciolosis.

### **2.3. Study Design**

A cross-sectional survey was conducted from June, 2018 up to December 2018 to determine prevalence of ovine fasciolosis in Oromia region, South West Shoa, Dawo Woreda Busa town.

### **2.4. Sample Size Determination**

A total of 285 sheep (100 from Qarsa Galute, 90 from Qarsa Bonbi, 95 from Burqa Gode) were randomly collected and examined by following coprologically examination procedure. The study was conducted on sheep at the field areas from farmers, which bring in Busa Veterinary clinic. Since there is no previous information on the level of prevalence of ovine fasciolosis was estimated 50% of expected prevalence and the sample size was determined using the formula (Thrusfield, 1995).

$$N = \frac{1.962 \times P_{exp} \times (1 - P_{exp})}{d^2} = 285$$

N=number of study population, P<sub>exp</sub>=expected prevalence, D=desired precision

### **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, Season and place of origin (Woreda). Sedimentation technique was used a qualitative method for detecting *Fasciola*.

### **2.6. Data Analysis**

The 285 clinical investigations for prevalence was analyzed using statistical package for STATA 7.1. Variation of the prevalence between different groups was analyzed by using chi square (X<sup>2</sup>) test. The

associations of fasciola infection rates because of sex, age, site and prevalence were compared using chi-test or t-test.

### 3. RESULTS

#### 3.1. Overall Prevalence

From 285 fecal samples examined from sheep for ovine fasciolosis during the study periods, 150 samples were positive for liver fluke infections with an overall prevalence rate of 52.63% (Table 1). Difference in prevalence rate was observed among the three study sites from which the samples were collected. Hence, the prevalence rates recorded were 46.6% in Qarsa Galute 23.3% in Qarsa Bonbi and 30% Dhaka Burqa Gode (Table 1). Infection rates on age and sex basis were also compared and as a result, no significant difference in prevalence was observed between the two age groups (Table 3&4).

**Table1.** Overall ovine Fasciolosis prevalence

Result	No. of Animal Examined	Prevalence (%)
Positive	150	52.63%
Negative	135	47.36%
<b>Total</b>	<b>285</b>	<b>100</b>

**Table2.** Prevalence of ovine fasciolosis the basis of site

Site	No. of Animal Examined	No. of positive Sample	Prevalence (%)
QarsaGalute	100	70	46.6%
QarsaBonbi	90	35	23.3%
BurqaGode	95	45	30%
<b>Total</b>	<b>285</b>	<b>150</b>	<b>100</b>

**Table3.** Prevalence of ovine fasciolosis on basis age

Infection rates on age basis were also compared and as a result, no significant difference in prevalence was observed between the two age groups (Table 3).

Age	No. of animal examined	No. of positive sample	No. of Negative Sample	Prevalence (%)
Adult	200	120	80	80%
Young	85	30	55	20%
<b>Total</b>	<b>285</b>	<b>150</b>	<b>135</b>	<b>100</b>

The prevalence rate on the basis of sex also analyzed and the statistical analysis 66.6% in female and 33.3% in male showed no significant difference ( $P > 0.05$ ) (Table-4).

**Table4.** Prevalence of ovine fasciolosis on basis of sex

Sex	No. of Animal Examined	No. of Positive Sample	No. of Negative Sample	Prevalence (%)
Female	180	100	80	66.66%
Male	105	50	55	33.33%
<b>Total</b>	<b>285</b>	<b>150</b>	<b>135</b>	<b>100</b>

**Table5.** Prevalence of fasciolosis at basis of season

Season	No. Of animal examined	Number of positive sample	No. Of negative sample	Prevalence%
June	90	50	40	33.3%
July	40	24	16	16%
August	20	10	10	6.66%
September	25	14	11	9.3%
October	50	22	28	14.6%
November	60	30	30	20%
<b>Total</b>	<b>285</b>	<b>150</b>	<b>123</b>	<b>100%</b>

### 4. DISCUSSION

The result of the study showed the distribution of 285 ovine examined for Fasciolosis by age. 85 (20%) ovine examined were young, 200 (80%) were adult. The result of study showed the distribution

of ovine examined for Fasciolosis by sex, 33.33% animals were found male and 66.66% female. The prevalence of fasciolosis was higher in female animals than in male (Table-4), nevertheless it was not significant ( $P>0.05$ ).

Younger animals showed higher prevalence than adult ones (Table-3), however, the variation as not statistically significant ( $P>0.05$ ). This indicates that both sex and age seems have no impact on the infection rate i.e. both sex & age groups are equally susceptible to fasciolosis. Similar results that support the present finding were reported by (Aseged, 1990, Mulualem, 1998, Jarso, 2016).

According to statistical analysis of infection rates based onsite, the lowest prevalence rate (23.3%) was recorded at SodoLiban, while the highest rate (46.6%) was observed at Soyoma. These differences in prevalence among the three selected study sites were not statistically significant ( $P>0.05$ ) (Table- 2). Similar result that supports the present finding was reported by (Ahmad *et al.* 2011; Jarso, 2016).

Concerning seasonal prevalence of ovine fasciolosis from highest to lowest prevalence was recorded 33.3%, 20%, 16%, 14.6%, 9.3%, and 6.66%, during the months of in June, November, July, October, September and August respectively. The highest prevalence was recorded 33.3%, 20% in June and November. The difference in monthly prevalence was significant ( $P<0.05$ ). To Shaw (Table -5) this difference may be due to rainy season and the lowest prevalence was recorded in August and September month where the green feed was not available due to dry season of the month. The prevalence of fasciolosis was higher in the wet season of the year. This difference may be due to bionomic factors such as monthly total rainfall, average humidity and temperature similar work was done by Mulualem. (1998). High prevalence rate were recorded in December and January during the study period. Previous studies carried out in Debre Berhan have indicated October/ November as period of maximum infection of sheep with liver flukes (Jarso, 2016).

## **5. CONCLUSION AND RECOMMENDATIONS**

The current study showed presence of high prevalence of fasciolosis in sheep However, low prevalence was recorded on sheep three-study site and its surrounding. This suggests that fasciolosis of the major constraints of the health & productivity of ruminants in the area. As a result, attempts' should be done to minimize the economic losses caused by ovine fasciolosis.

Therefore, based on the above concluding remarks the following points are recommended.

- Appropriate intervention should be applied to minimize this high prevalence of fasciolosis in the area by training farmers and extension workers
- Laboratory equipment, reagents and chemicals should be available in good quality and quantity to perform confirmatory diagnosis of internal parasites.
- The animals should be dewormed on time and take an account on management system.
- Further detail study should be made on species composition distribution and economic importance of fasciolosis in the area.

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