

# Prevalence of Bovine Fasciolosis in and Around Anchar Woreda, West Hararghe, Eastern Ethiopia

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**Abstract:** The present study was conducted from April 2015 up to the end of November 2015 in the west Hararghe Zone, Oromia region, Eastern part of Ethiopia in and around Anchar district with the aim to determine or to know the prevalence of bovine fasciolosis in and around Anchar and to recommend the controlling method of fasciolosis in study area. The method employed in the study area was sedimentation technique. A total of 385 were selected randomly from the study populations and from the total examined 79 (20.5%) cattle were positives for fasciolosis. The recorded fasciolosis prevalence was varying from 18.9% to 25.5% in the different sites of the study area and the overall prevalence rate of 20.8. The prevalence of disease in age (young) 2.45% and Adult 28, 89% Sex (Male) 1.63% and female 37.81% and body condition (poor) 22.1% and 19.46% was recorded. Infection rate different age, sex, site and body condition of animal showed not statistically significant different. Therefore, it is possible to conclude that fasciolosis is the prevalent diseases in the study area, and the disease need due consideration both from the livestock owner and the veterinarian, in the light of present study. Finally, a few points of recommendation were forwarded to alleviate the problems of fasciolosis in this area.

**Keywords:** Prevalence, Anchar, Fasciolosis, Bovine

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## 1. Introduction

Bovine fasciolosis is economically vital parasite disease of farm animals because of fasciolidae, which might be trematodes, of the genus fasciola. Mostly vital species of this genus are fasciola gigantica and fasciola hepatica. Ethiopia is one of the countries with the best populace of cattle, greater than 31 million farm animals [1]. But the productiveness is a way much less than the ability because of numerous constraints like sickness, malnutrition and conventional management. the wealthy ability from the cattle zone isn't efficaciously exploited [2].

Fasciolosis is disease caused by of fasciola gigantica and fasciola hepatica is one of the mostly familiar helminthes contamination of ruminant in distinct a part of the sector together with Ethiopia. The presence of fasciolosis because of fasciola hepatica and fasciola gigantica in Ethiopia has

lengthy been recognised and its occurrence and financial importance has been suggested with the aid of using numerous workers [3 6, 42, 32]. Fasciola Hepatica and fasciola gigantica occurs relatively cooler semi-highland and highlands and lowlands respectively, in which the intermediate is abundantly to be had for the duration of the moist season [36] fasciolosis happens typically as a persistent sickness in farm animals and the severity frequently relies upon at the dietary popularity of host [15]. It is chargeable for an extensive unfold morbidities and mortalities particularly in farm animals and sheep characterized with the aid of using weight loss, anemia, hypoproteinemia [40]. The impact due fasciolosis also can expressed in phrases of mortality, morbidity, decreased boom charge, livers condemnations at slaughterhouse, discount in traction power, much less weight advantage at birth, improved susceptibility to secondary contamination and the price of management

measures [17, 22].

Diagnosis is primarily based medical sign and seasonal incidence in endemic regions however preceding exam, hematological check and exam of faeces for fluke egg are useful. Coprological evaluation remains typically hired to diagnosis bovine fasciolosis regardless of the reality that egg can't be detected till after the latent duration of contamination, whilst a good deal of the livers harm has already occurred [27]. These have a look at become supposed to decide the superiority of fasciolosis in farm animals slaughtered in Bedele municipal abattoir, to evaluate, diagnostic the performance of fecal exam and postmortem exam and to decide the mostly relevant species of the liver fluke.

The objectives of this study were become:

- 1) To estimate, the prevalence of the liver fluke and most prevalent species of liver fluke in cattle that slaughtered at anchar woreda municipal abattoir.
- 2) To compare, the efficiency diagnosing fecal examinations and postmortem examinations in cattle that slaughtered at anchar woreda municipal abattoir.

## 2. Literature Review

### 2.1. Parasite and Its Morphology

Fasciolosis organism, taxonomic classifications are presented as follows [36].

Phylum: -Platyhelminthes.

Class: -Trematode.

Sub-class: - Fasciolidae.

Family: -Fasciola.

Species: *Fasciola hepatica* and *Fasciola gigantica*.

The adult parasite *Fasciola hepatica* have flat leaf-like frame that measures 20-30 mm lengthy with the aid of using 8-15 wide [42]. Its anterior elongation (cephalic cone) on which the oral and ventral suckers, which can be nearly same length are placed. The vitellaria are exceedingly branched and diffuse withinside the lateral and posterior area of the frame. *Fasciola* huge is parasite very much like *Fasciola hepatica*. Its length may also range 25-75mm lengthy with the aid of using, 15 mm wide's [31]. Additionally, the cephalic cone is proportionally shorter than that of *Fasciola hepatica*, it's frame even extra of like in shape [31]. The eggs of *Fasciola hepatica* is oval, operculate, large (150mm×130mm), and yellow and approximately instances the dimensions of strongyles egg [36]. The egg of *Fasciola* is huge and its length measures up to (200nm×100hm) [42].

### 2.2. Life Cycle

The existence of life cycle of *Fasciola* species is regular of digenic trematode. Eggs laid with the aid of using the adult parasite withinside the bile ducts in their hosts by skip into the duodenum with bile the eggs then leave the hosts via the faeces. At these stages, egg remains now no longer embryonated, similarly improvement to maturation is taking about weeks. The eggs hatched to launch the motile miracidium, to find and enters the intermediate snail's host.

Then want to locate the best host to penetrates is a pressing one, for the one's miracidia failing to prepare.

Commonly die within 24 hours. After the penetration of the snail, the miracidia lose its cilia and emerge as sporocyst [43]. The sporocyst forming and dividing radial (have sucker and primitive intestine), and a completely mature radia displaying radia and cercaria phases. the cercaria of *Fasciola* species have a rounded frame measuring about 0.5 mm lengthy. the motile cercaria snails regularly leaves the shell 4 to 7 weeks after contamination with the aid of using migrating via the tissue of snail. This is during wet situation whilst acritical temperature of 10°C is exceeded [43].

On growing from the snails, the cercaria, attaches to submerged blades of grasses or different flora like, watercress, and the tail falls away and the cercarial frame secret 4 layered cyst masking from cytogeneses gland placed at the lateral areas of the frame. The formations of the wall may also soak up to 2 days, the metacercaria (encysted, resistant cercariae) is the infective form of the definitive host. Generally, metacercaria are infectious to ruminants which includes livestock and sheep, moreover to different mammals along with human beings. One miracidium hatching from a fluke egg can produce as much as 4,000 infective cysts (metacercariae) because, of the vegetative multiplications on the sporocyst and radia stage. the metacercarial cyst is handiest fairly resistance, now no longer being capable of live on dry conditions. If they'll live on for as much as a year [4., 30, 42], contamination via has a car of contamination in non-endemic regions. The metacercarial cyst, whilst ingested on my own with the tainted flora with the aid of using the definitive hosts, enters to the small intestine, liberating the younger parasite, that penetrates the intestine wall, coming into the peritoneal cavities.

From that part it, migrates without delay to the livers, over a period of about seven days. The young fluke (adult fluke) then penetrates the livers tissue, via which it migrates, to feeding on bloods, for approximately 6 weeks. After this period, the flukes enter the bile ducts, and mature in to absolutely a duct parasite after approximately 3 months from preliminary contamination. Egg manufacturing then commences and finishing the existence cycle [42].

Adult flukes were lives on for decades withinside the livers of inflamed host. and lays among 20,000 to 50,000 eggs in keeping with days. The charge of egg manufacturing is chargeable for the diploma of pasture infection and for that reason significantly impacts the epidemiology of the disorder and additionally motivated with the aid of using the grazing addiction of the animals. Animals which graze in moist marshy regions desired with the aid of using intermediate hosts are much more likely to emerge as inflamed. Characteristically, lengthy, and moist season are related to a better charge of contamination [4].

### 2.3. Host Range and Epidemiology

#### 2.3.1. Intermediate Host

Genus *Ilymnaea* snails are the intermediates host for the genus *Fasciola*. The epidemiology's of *Fasciola* is depending

on the ecology of this snail intermediate hosts. *Lymnaea* species is mostly vital within the transmissions of *fasciola hepatica*. Includes *Lymnaea truncatula*, in North America. *Lymnaea tormentor* in Australia. Other species, that have been incriminated within the transmission of *fasciola hepatica*, includes, *Lymnaea viator* and *Lymnaea Diaphana* (South America), *Lymnaea columinela* (USA, Australia, Central America, and New Zealand), *Lymnaea humilis* (North America) [30., 42].

*Lymnaea truncatula* is mostly not unusual place intermediate hosts for *fasciola hepatica* in specific a part of the world [22], and in parts Ethiopia [2]. And it is amphibious, and even though they spend hour, in shallow water. They sometimes emerge directly to nearby mud. They can withstand summertime season draught or iciness freezing for numerous months with the aid of using the respectively hibernating deep or estivating within the mud [36]. It prefers, wet temperatures condition (15-22°C) via it seem that diverse observed us the tropics have diversifications to better temperature commonly within the lowland regions and may be kind and live on the 26°C with enough moisture.

The mostly vital intermediate hosts of the *fasciola* huge is *Lymnaea natalensis* and *Lymnaea auricularia* [36., 30., 42]. *Lymnaea auricularia* that's the additionally the vital species within the southern part of USA, the Middle East, and pacific islands. *Lymnaea natalensis* is diagnosed intermediate hosts for the *fasciola* huge [41]. And different species serving as secondary hosts to this species are *Lymnaea referencens* and *Lymnaea acuminata* (Indian and Pakistan) and *Lymnaea natalensis* is exactly aquatic snail frequently observed in Africa. it serves as intermediate hosts for *fasciola* huge, calls for well oxygenated, and unpolluted water bodies, and might estimate during dried periods. The requirement Optimal temperature for the entirety of the parasite improvement degree with the within the snails is 22 to 26°C. Though, in irrigation regions snail breeding is much less circumscribed and could be maintain all the years round, besides for length of extreme temperatures levels [36].

### 2.3.2. Final Host

Final host is chargeable for the development and laying of a giant wide variety of egg. Hosts of *fasciola hepatica* is mostly mammal, livestock and sheep's being mostly vital. *fasciola gigantica* impacts a wide variety of home animals and is observed in low land areas changing *fasciola hepatica*. In the uncommon host which includes moons of the fluke perhaps observed in aberrant site which includes the lungs [36].

### 2.3.3. Epidemiology

Fasciolosis is disorder because of liver fluke reason *fasciola hepatica* and *fasciola gigantica*. These species of parasites are extensively dispensed in regions in which climatic situation are probably moist at some stage in the year which the life of parasites is in large part depending on those factors, and additionally the feasible prevalence of parasites is interrelate host. *fasciola* huge predominate considering the fact that *F. hepatica* is extra localize species.

*F. gigantica* is observed in which ever ecological situation are favorable to the intermediate host which includes boundaries of lakes flood susceptible regions low mendacity marshes and the drainage ditches. It is absent from quickly swimming pool, and water areas that disappear within the dry seasons [30].

Distributions and the form of intermediate hosts (*Lymnaea*) additionally range relying on localities for examples, *Lymnaea truncatula*, is exceedingly dispensed in Europe, Asia, some of Africa and Northern America, whilst, whilst *Lymnaea natalensis* is taken into attention to be African snail host [33].

## 2.4. Factors Affecting the Production of Metacercariae

### (i). Availabilities of Satiabale Snail Habitat

The greatest vital intermediate hosts of *fasciola* is *Lymnaea truncatula*, and *Lymnaea natalensis*. The availability of those intermediate host relies upon on climatic circumstance, for instansis. *Lymnaea truncatula* pick moist dust to loosen water and everlasting habitat consist of the financial institution of the channels or streams and the age of small pond. Hoof marks, wheels ruts or rain ponds. Foot marks, wheels furrows or rain pond may also offer following heath rainfall and flooding, brief habitats, fields with clumps rushes are regularly suspected sites. Though a moderate acidic PH surroundings is most excellent for *Lymnaea truncatula*, immoderate acidic PH degrees are factors consisting of arise in peat baggage and regions of sphagnum moss [19].

### (ii). Temperature

Temperature is a vital component distressing the fee of growth of snails of the level of the parasite out of doors of the very last hosts. A men, daytime, or evening time temperatures of 10°C or above is essential each for snail and all sports quit at 50°C. that is additionally minimal variety for the improvement and hatching of *fasciola hepatica* egg. However, it's miles most effective whilst temperature upward push to 15°C and it kept above that degree a importance duplication of snail and flukes larval level ensures [36].

### (iii). Moisture

The best moisture circumstance for the snail breeding, and the improvement of *fasciola hepatica* within snails are furnished whilst rain exceeds transpiration, and discipline saturation reached. Such circumstance also is significant for the developing fluke eggs, for mirabilis attempting to find snail and for the spreading of cercariae being sheds shape the snail [35].

### (iv). PH

Areas with clumps of footages are not unusual place length or they've moderate PH eggs hatched at 27°C will grow and hatch within a PH variety of 4.2 to 9, however over PH 8.0 improvement is prolonged [27].

## 2.5. Clinical Signs

The scientific factures of fasciolosis may have acute, sub-acute and continual forms. The acute fasciolosis takes place

as ailment outbreak following a huge, however extraordinarily quick time consumption of metacercarial [36]. The excessive fluke consumption is regularly the end result of positive seasonal and fluke manipulate measures. It usually takes place whilst shares are pressured to graze in drought. Animal tormented by acute Fasciolosis is specially belly ache and soreness and can expand jaundice [30], in a few cases, liver tablet may also rapture, and fluid may also lick into the peritoneal hollow space inflicting dying because of peritonitis.

More usually, on ingestions of less metacercariae, fever and eosinophilia are seen. Death typically consequences from blood loss because of hemorrhage and tissues destructions resulting from migratory juvenile fluke [30].

Sub-acute Fasciolosis is resulting from ingestion of a slight of quantity of metacercariae is characterized through anemia, jaundice and sick thrift, the migrating fluke reasons significant tissue damages hemorrhage big and especially liver harm. The end result is extreme anemia. Liver failure and dying in 89-10 weeks [34].

Chronic fasciolosis is mostly not unusual place animal syndrome in livestock. It takes place whilst the parasite reaches, the hepatic bile ducts. The fundamental outcomes are bile duct obstructions, destructions of liver tissues, hepatic fibrosis, and anemias. The start of scientific signal is slow, animal come to be steadily anemia and anorexia's because the mature flukes come to be energetic with in bile duct and signal may also consist of dependent. Death in the end takes place whilst animal will become extreme. Cattle are usually gift with signal of weight losses, anemia, and continual diarrhea [21].

Additionally, a circumstance regarded as "black ailment" is a problem, which typically is deadly. Here, as secondary contamination because of the bacteria *Clostridium novy* kind B, proliferating, a necrotic lesion for the deadly result [43].

## 2.6. Pathogens and Pathophysiology

Pathogenesis of the fasciolosis fluctuates in line with the parasitic improvement section. The developmental levels are biliary levels and parenchyma. The parenchymal section takes place during the migration of fluke and from the harm to the bile ducts mucosal membranes through their cuticle's spines [34].

Occurrence of flukes withinside the biliary channel elicits substantial tissue's reaction, main to cholangio hepatitis. The wall of the duct will become infiltrated with eosinophilia, lymphocytes and macrophages. And in the end come to be substantially thickened from fibron proliferations and calcifications [16]. The decrease, movement and hobby of adolescent flukes via the liver parenchyma is likewise related to hepatic fibrosis, which inhabit intra-parenchyma maturation and calcified cholangitis which defers flukes of their hepatogenic activities each of those lesion related phenomena assist livestock to withstand continual fasciolosis [12]. Besides, the truth that liver possesses substantial features fallback and deteriorating ability assist animals to live on with none huge development of hepatic features even

till there of the organ is damaged [9].

Fasciolosis has important impact on blood component (plasma proteins) Hypoalbuminemia and hyphoglobuinamia usually arise in liver flukes' contamination in all the hosts species. During the parenchyma level of the contamination, liver harm resulting from the migration flukes' compromises liver features, which in sheeps and calves is pondered in a weakening of plasma albumin awareness credited in part to lessen fee of synthesis and in part to an enlargement of the plasma volumes [34].

Nevertheless, during biliary level of the contamination lack of blood from hematophagia and into gut is too significant, inflicting extreme anemia that artificial ability of the liver is inadequate to update the lack of albumins that excretions through the Hyper plastic bile ducts (cholangitis). Therefore, a revolutionary lack of plasm albumin takes place in all contamination host species, beginning from across the time the fluke commences blood feeding. This brings about disorder of intravascular and extravascular oncotic pressures main to improvement of edema [36].

## 2.7. Diagnostic Processes to Fasciolosis and Treatment

Diagnosis of the fasciolosis is each in animal and guy may also contain concerns of diverse factors including history, medical finding, and widespread epidemiology of the disorder affirmation in all instances may be made both via way of means of faecal exam or restoration of worms at autopsy exam. Currently serological and molecular strategies are evolved via way of means of diverse researcher. Examination of the enzyme and hematological profile also are recognized to provide vital due as to the existence of Fasciolosis in animas [23, 26].

### 2.7.1. History and Clinical Manifestation

Infection with *fasciola hepatica*, is normally related to herd and flocks that graze moist, marshy land. *fasciola* significant makes use of a water snails as its intermediate hosts. Hence, contamination with this species is related to cattle consuming from snail infected watering locations in addition to with grazing moist land which can be seasonally in dateless [23].

In acute instances of Fasciolosis, surprising dying and intense anemia, excessive fluke egg remember, dying takes place 12-20 weeks after contamination and in continual fasciolosis sluggish wasting, intense anemia with ascites, bottle jaw edema and excessive fluke egg remember may also cause dying extra 20 weeks after invasion [33, 25, 30].

### 2.7.2. Post Mortem Examination

The greatest straight and dependable approach for the analysis of fasciolosis is liver exam at slaughtered or necropsy. In acute fasciolosis, where can be peritonitis, specifically at the visceral floor of the hepatic capsules. Then livers is swollen. friable and has capsular punctures noticeable via way of means of hemorrhagic [36].

Calcification of bile duct and growth of the gall bladder are traits lesions discovered in continual instances of fasciolosis. Advanced biliary cirrhosis in which the end

products a hard fibrotic liver wherein the bile duct is prominent, thicken fibrous and in livestock, regularly calcified. Histological, the fibrosis is formed via way of means of restore to the migrant tract and a cholangitis, fluke, and several eggs [30].

### 2.7.3. Faecal Examination

Two factor wishes to be saved in thoughts even as decoding faecal inspections end results for fasciola hepatica:

- a) the prepatent duration is for fasciola hepatica is two to three months. As a result, fluke egg can't be confirmed early withinside the contamination. An institution of livestock can be wearing an excessive burden of young, fluke, however no fluke eggs could display up of their manure.
- b) the measurable extent of fluke egg counts is doubtful. Fluke egg pool withinside the gall bladder and occasionally by skip in to the faces the fluke egg assume any given day regularly has tittle courting to the wide variety of fluke withinside the liver; an animals with a terrible fecal can be parasitized, in which as an excessive fecal fluke egg remember ought to simply be a excessive wide variety of egg leave-taking the gallbladder that day, in preference to a goal fluke burdens [8].

Sedimentation process focusses each faeces and egg at the lowest of a liquid medium normally water and hit upon mostly parasites egg or cyst which have too excessive a particular enormity particularly trematode (fluke) eggs (Hendrix, 1998). Faecal examination for fluke egg needs use of faecal sedimentations, formalin ether or floatation's strategies. Faecal examinations for fluke egg require use faecal sedimentation, formalin –ether, or floatation approach [5, 38, 18].

The older capsules including carbon tetrachloride hexachlorophene and hexa-chlorothene are nevertheless utilized in a rare international location. One of the selection capsules is triclabendazole which do away with all growing tiers over 1 week old. Other capsules are rapoxanide, closantel and nitroxylnil, as a way to do away with flukes over 4 weeks old [36]. Outbreak of continual fasciolosis may be efficiently reared with a unmarried dose of any of set up of dims (rafoxanide, nitroxylnil, borotianide, closeted oxyclozanid and triclabendazoles). Albendazole and natobimin is likewise powerful organist grownup fluke albeit at multiplied dosage rate [36, 11]. In lactating cows in which the milks is used for human consumptions the above drug is both banned or have prolonged withdrawal duration in mostly international locations and has milk with retaining time of up to a few days. Effectiveness of triclabendazole is among 90% and 100% in opposition to immature and mature flukes [20].

## 2.8. Controls and Preventions of Fasciolosis

### 2.8.1. Applications of Strategic Treatment

Prophylaxis with the aid of using capsules includes removal flukes with the aid of using ordinary remedy. Since

nearby climatic situations encouraged infections. They must be taken into consideration whilst figuring out the time of remedy it's far glaring that the manage techniques for liver flukes' contamination range in step with the vicinity and control practices.

Two remedies are advocated in step with years for the Sahel vicinity. the primary is given at stop of wet seasons (October-November) to get rid of the grownup parasite to in order that the animal by skip the dry season in appropriate situation and to keep away from infection from the stop different dry seasons (March, April or not often later) whilst the mature fluke travel via the hepatic parenchyma. For the next one remedy best capsules which are energetic towards immature flukes must be used [14].

### 2.8.2. Control of Snail

#### (i). Chemical Methods

The usage of molluscicides for the management of snail intermediate hosts is a capability device for the management of fluke infection. Before thinking about chemical manage of snail, it must be cited that several habitats are topographically incorrect for using molluscicides and it's far frequently very hard to use them efficiently. They are poisonous to the surroundings, collaboration among adjacent houses is needed for required for powerful cowl and ordinary (at the least early) software is needed because speedy repopulation of snail may also occur [17].

#### (ii). Biological Methods

Description from numerous components of the arena shows that some of plates have molluscicidal houses. Planting of those timber and shrubs alongside watercourses and irrigation channels can decreases the wide variety of snails in proportion [17].

#### (iii). Management of Snail Habitats

Respectable drainage and the constructing of dams at suitable web website online marshy and low-mendacity location may also lessen the snail hassle. Water hollow must be controlled anywhere feasible to save you each concentrating of the water with dirt from inflamed animals and improvement of *Lymnaea natalensis*. For these functions all swimming pools or again waters must be crammed in and changed with the aid of using properly or tanks. This is best feasible in will devices including ranches or breeding farms. Troughs close to properly must be raised in will devices including ranches far from pasture infection with metacercariae. This may also best be feasible whilst the wide variety of animal concerned is minor. Start right watering centers to save you animals consuming from lake, pond and stream [17].

#### (iv). Forecasting the Occurrences of the Disease

The geographical, records machine (GIS) may be used to outline the epidemiology's and distributions of fasciolosis primarily based totally on climates, geographical and soil hydrological data. The existence cycle of liver fluke and the superiority of fasciolosis are domination in climate [30].

For casting, the incidence of fasciola with the aid of using the use of geographic records machine (GIS) for forged version primarily based totally on wetness and thermal regime become evolved to evaluate the threat of fasciolosis. The precise biology and existence cycle method of fasciolosis make it and amenable to powerful models, geographic records machine and destiny professional or know-how primarily based totally machine. This machine could we used to endorse farmer and small holder at the mostly suitable manage method for protective their animals [29].

### 2.9. Bovine Fasciolosis in Ethiopia

In Ethiopia, *F. hepatica* is huge unfold in regions with altitude zero 1200 to 2560 m.a.s.l while, fasciola big seems to the mostly not unusual place species in regions under 1800 meter above sea degree. Both fasciola species co-exist in regions with mind-set ranging among 1200 to 1800 m.a.s.l [41]. Ethiopia is one of the nations with appropriate climatic situations for the life of fasciolosis. The sickness purpose extreme hassle in serious problems in cattle populace of the country. Both the fasciola gepatica and fasciola hepatica are discovered in Ethiopia and transmitted with the aid of using the snail known as *Lymnaea truncatula*, and *Lymnaea natalensis* correspondingly. Their pathogenic importance relies upon at the favorability of surroundings they live [2].

### 2.10. Public Health Importance of Fasciolosis

Ain the human cases of fasciolosis is rising as an critical sickness at some stage in the arena. The instances are related in the main with the consuming of watercress's infected with metacercariae. Fasciola hepatica can be obtained with the aid of using guy, now no longer immediately from the livestock someone need to ingest the metacercariae with a view to emerge as inflamed [12]. The worldwide estimate occurrence is among 2.4 r and 17 million human infections, and further, one hundred eighty million prone to contamination [19]. The diploma of pathogenicity of fasciola hepatica to guy relies upon many features, specifically the wide variety of worms gift and the organism inflamed, for instance, the occurrence of fasciola hepatica withinside the bile duct of guy purpose plenty of signs like malaise, irregular fever, weight reduction and anemia Adult fasciola hepatica also can be discovered in unusual sites including withinside the lung and subcutaneously. At this time, the parasite is discovered withinside the cyst comprising brownish purulent things, they will be eliminated surgically [10]. The irregular human contamination become additionally stated in Ethiopia [40].

## 3. Material and Methodology

### 3.1. Study Area

The study was conducted from April 2015 to end of November 5, 2015 in the west hararghe zone of oromia regional state of eastern parts of Ethiopia in and around Anchar woreda, which is about 310 km far away from Addis

Ababa city as information gained from Anchar Agricultural office [7]. Anchar geographically located between 8°26'N and 36°20'E and of an altitude of 1500-2300 m.a.s.l. The woreda have kola, woina-dega, and dega respectively. Also, the woreda has 8.87'of grazing land, 42.8 farmland, 7.2 forest, 0.2 swampy and 40'hill.

The number of woreda population is estimated to be 119180 live in rural and 29358 live in urban. The livestock of woreda 52197 cattle 15230 sheep, 11090 goat, 2504 equine, 38364 poultry, and the production of Animal in the woreda is extensive management system. The mean annual rain fall of the woreda is 1950mm and the minimum and mostly average temperature ranges between the 12.4°C and 24°C respectively.

### 3.2. Study Population

The study population comprises cattle of local bread which managed under traditional management system. There are total number of 52197 cattle in woreda. From this total number of cattle 385 cattle were taken from (Injicha, Dindin, Seka, and Inchinni) in and around Anchar woreda. Totally to determine the prevalence of bovine fasciolosis in and around Anchar woreda 385 cattle were randomly selected.

### 3.3. Study Design

The cross-sectional study design was used for research with the assumptions that it could help to get an understanding of the current state of problem by describing it in relation to determine the prevalence of bovine fasciolosis in and around Anchar.

### 3.4. Sampling Size

Sampling method was simple random sampling techniques followed to select the animal to be used for the study of the prevalence of bovine fasciolosis in the study area. To determine the sample size, a bovine fasciolosis prevalence of 50% in Anchar was taken into consideration. The desired samples for the study were calculated according to formula given by thru field [32] with 95% confidence interval and at 5% obsolete precision. Therefore, sampler size of 385 was considered for this study. Formula for sample size determination is given below.

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

Where: n= required sample size.

Pexp= the expected prevalence.

d = the absolute precision.

Totally, 385 cattle were randomly sampled in and around Anchar to determine the prevalence rate.

### 3.5. Study Methodology

Random sampling of fecal sample from a total of 385 cattle were collected directly from the rectum into the universal laboratory sampling bottle that contain 10/ formalin as preservative for further laboratory diagnosis, then

transport to laboratory for detail ceroscopy examination. during the face every l sampling information on Kebele, sex, age, and body condition of individual animals were recorded. Animals were classified into two groups Young (1\_3) and Adult (>3years). Further processing of the fecal sample in the laboratory were employed using sedimentation techniques [35] (Annex 2).

### 3.6. Statistical Analysis

The total prevalence's rate was calculated based on the fecal tested positive result by diving the number positive result of animal by total number of animals tested. All raw data generated from the study of were entered into MSEXCEL data base system. The data imported in to the data base system where information such as age, sex, site, and body condition. Statistical analysis was done using SPSS 16 computer chi-square ( $\chi^2$ ) test to determine the variation in infection prevalence in age, sex, sites and body condition. significances were considered with the p-value less than 0.05.

## 4. Result

### 4.1. Prevalence of Bovine Fasciolosis in and Around Anchar

At the time of study period from April 2015 to the end of November 2015, 385 cattle were examined from four sites /kebeles to determine the prevalence of bovine fasciolosis in and around Anchar. Out of 385 examined cattle, about 79 (20.5%) cattle were positive for fasciolosis. The higher prevalence was prevailed in Dindin (25.27%) and the lower one was in Seka (18.36%). The statistical analysis showed there is significant ( $p>0.05$ ) difference in prevalence in sites.

**Table 1.** Coproscopy survey result of bovine fasciolosis in and around Anchar.

Site	No of examined cattle	No of positive	Prevalence (%)
Injicha	96	19	19.79%
Seka	98	18	18.36%
Dindin	91	23	25.27%
Inchanni	100	19	19%
Total	385	79	20.5%

$\chi^2 = 0.25$  P value= 0.0006.

### 4.2. Prevalences of Bovine Fasciolosis in Age Category

During this study period, cattle were classified based on their age group (1-3 year) young and greater than (>3 years) are Adult based on this classification of animal in age, prevalence of bovine fasciolosis was studied in & around Anchar. their as it can be shown from the Animal age classification of field area showed.

From 122 examined young (1-3 year) cattle about 3 (2.45%) cattle were positive of fasciolosis and among the 263 examined adult (>3 year) cattle 76 (28.89%) of them were positive for fasciolosis with an overall prevalence of 20.5%. The analysis revealed that there is not significant difference

in the prevalence ( $P>0.05$ ) between the age group.

**Table 2.** Comparison of prevalence's of bovine fasciolosis between age category.

Age	No: of examined cattle	No: of positive	Prevalence%
Young	122	3	2.45%
Adult	263	76	28.89%
Total	385	79	20.5%

$\chi^2=46.39$  P=0.1187.

### 4.3. Prevalence's of Bovine Fasciolosis in Sex Category

From the total number of 385 cattle that randomly selected and examined in and around Anchar woreda, about 184 were male of which 3 (1.63%) of them were positive for fasciolosis and 201 of them were female from which 76 [28] of them were positive for fasciolosis. statistical analysis showed that no significant ( $P>0.05$ ) difference in prevalence between the sex category as indicated from the following table.

**Table 3.** Comparison of prevalence of bovine fasciolosis between different sex.

Sex	No: of examined cattle	No: of positive	Prevalence
Male	184	3	1.63%
Female	201	76	37.81%
Total	385	79	20.5%

$\chi^2=93.56$  p value =0.2394.

### 4.4. Prevalence of Bovine Fasciolosis in Body Condition Bases

From the examined 203 poor body condition cattle about 1 (0.492%) cattle were positive of fasciolosis and among the 182 examined good body condition cattle about 78 (45.82%) cattle were positive of fasciolosis. statistical analysis shows that no significance ( $p>0.05$ ) different in prevalence between the body condition.

**Table 4.** Comparison of Prevalence of bovine fasciolosis in body condition bases.

Body condition.	No: of examined cattle	No: of positive	Prevalence (%)
Poor	203	1	0.492
Good	182	78	45.82
Total	385	79	20.5

$\chi^2=129.59$  P. value= 0.3316

## 5. Discussion

In this present study, the data provided the prevalence on the bovine fasciolosis in and around Anchar woreda. Out of 385 faecal sample analyzed 79 (20.5%) found to be positive by using sedimentation method as diagnostics method which represent prevalence, of bovine fasciolosis in and around Anchar woreda. The result presented that there is no significant variation ( $P>0.05$ ) between the site. Previous

studies showed in different parts of Ethiopia [13] 62.2% in Bahir dar, [39]. 81.6% in Ambo, [10] 56.6% in Ziway, [24] 34% in Wolliso and other revealed a much higher prevalence rates as compared to the present finding. This variance in prevalence of fasciolosis, in Ethiopia may be associated with differences in ecological factors accessible for the snail intermediate host.

The 20.5% prevalence of bovine fasciolosis found in this study is agree with 18.99% prevalence of bovine fasciolosis stated at sodo, by [37] by means of fecal sample.

This study presented that there is not significant associations ( $P>0.05$ ) among the prevalence and the sex, age, body conditions in the study area. The possible description may be that cattles in the study area graze in not the same common grazing lands with the same agro ecological condition. Therefore, the chance of getting disease or becoming infected, is therefore, not the same and primary release of young stocks with adult.

## 6. Conclusions and Recommendation

This study presented on the prevalence of bovine fasciolosis for the period of eight [8] months in the west hararghe zone of oromia region in and around Anchar woreda showed that prevalence of 20.5%. Risk factor (site, age, sex, and body condition) includes in the study but there is no significant different between the prevalence. Therefore, it is possible to conclude that fasciolosis is the prevalent diseases in the study area, and the disease need due consideration both from the livestock owner and the veterinarian, in the light of present study. Finally, the following recommendations are forwarded.

- 1) Strategic anthelmintic treatments with its appropriate flukeicidal drugs should be experienced two times a year. i.e., previously and after the rainy seasons, to eradicate the fluke load of the animal and lessen the pasture adulteration by fecal eggs, shedding's, thus disturbing the life cycle.
- 2) Combinations of control actions including drainage, grazing managements and fencings should be used to guarantee acceptable degree of control in the long run.
- 3) Additional studies on the epidemiology's of the disease and ecology of the snail intermediate hosts are valuable in the arrangement and programming controls strategies.
- 4) Finally, the farmers should be well trained, educated and learnt about the information's of the diseases control programs, and good managements systems if lively future and improvements in the livestock's productions is needed.

## List of Abbreviations

A. A. U	Addis Ababa University
FAO	Food and Agriculture Organization
CO	Degree centigrade
Km	kilo meter
M	meter

Mm	millimeter
Cm	centimeter
m.a.s.l	meters above sea level
Rpm	round per minute
FVM	Faculty of Veterinary Medicine
F. hepatica	Fasciola hepatica
F. gigantica	Fasciola gigantica
GIS	Geographical information System

## Appendix

### Appendix 1. Body Condition Scoring

According to the Mari Heineken, (1989) during the study period body condition are classified in to good and poor based up body scoring method.

Body condition score 1: the individual sinuses are sharp to the touch and easily distinguished.

Body condition score 2: the spinouts processes can be indentified individually when touched but feel round than sharp.

Body condition score 3: the spinouts processes can only with very firm pressure and area of either side of the tail head have some fat cover.

Body condition score 4: Fat cover around tail had is easily seen as slight moods, soft to touch, the spinouts process of the cannot be felt.

Body condition of score 5: the bone structure of the animal is no longer noticeable, and the tail head is almost completely buried in fatty tissue.

Body condition of animal was classified in to 2, as poor and good.

Body condition score-1 and 2-poor.

Body condition score-3, 4 and 5-good.

### Appendix 2. Sedimentation Technique

- 1) 5gm of faces measured approximately and break down in 50ml of tape and stirred well with a stirring rod until homogenize.
- 2) The mixture is strain through a sieve. As much water as possible will press out of the debris through the sieve and the debris left on the screen will discard.
- 3) Poured into a conical centrifuge tube and centrifuge at 1500 rpm for 5 minutes.
- 4) The supernatant discarded and the sediment was agitated until thick homogenous fluid was obtained at the bottom of the tube after addition of one drop of methyl blue.
- 5) Then take by using pipette and drop on the microscopic slide then cover slip.
- 6) Examined by low power microscopy.

### Appendix 3. Data Format Used in Collection of Data

Zone west Hararghe  
District Anchar Woreda  
For fecal collection



Table 5. Data format used collection of data.

ID	Kebele	Age	sex	Body	Conditional	Result
1						
385						

## References

- [1] FAO (1993) Agrostat data statistics division, Rome, Italy. Fasciolosis.
- [2] Graber M (1978) Helminth and helminthiasis of domestic and wild animal in Ethiopia. Rev eleven Med Vet pays Trop 1: 13-95.
- [3] Abuna. F., Asfaw. A., Megersa, A. 2009. Bovine fasciolosis: Coprological, abattoir surveys and its economic impact due to liver condemnations at Soddo municipal abattoir, Southern Ethiopia, Hawasa University, faculty of Veterinary medicine. Hawasa, Ethiopia.
- [4] Andrews. S. J. 1999. The life cycle of fasciola hepatica. In: fasciolosis (Dalton, J. ed). CABI publishing Wallingford, UK. Pp. 1-30.
- [5] Antonia. M., Conceicao. P., Rute. M., Durao., Isabel. H., Costa. Jose and Correide. C. 2002 Evolutions of a simple sedimentation method (Modified Macmaster) for diagnosis, veterinary parasitology, 105, 337-343.
- [6] Argaw. K. 1998. Epidemiology of bovine fasciolosis in Galama Awraja (Arsi). In: Ethiopia veterinary Association preceding of the 12<sup>th</sup> conference, 11-12 June, Addis Ababa. Pp. 35-42.
- [7] Ancar Woreda Agricultural Bureau. 2006.
- [8] Briskey. D. W. 1998. Diagnosis of liver fluke infection in cattle. Veterinary Bulletin, 68.
- [9] Carlton. W. W., McGavin. M. D. 1995. Special veterinary pathology, second edition. University Graphics, Mosby. Year book. INC: Pp. 81-109.
- [10] Chandler A. C. 1949. presice de parasitology. 5<sup>th</sup> ed. Paris, Mason et. cie. Vol. 139: Pp. 1085.
- [11] Drug Administration and Control Authority of Ethiopia. 2006. Standard Treatment Guidelines for veterinary practice. Pp. 47-49.
- [12] Fasey. R. V. and marsden. P. D. 1960. fascioliasis in man, an outbreak in Hampshire. In: fasciolis (Dalton, J. P. ed). CABI. Publishing, walling ford, UK. Pp 422-42.
- [13] Fekadu. R. 1988. preliminary survey on bovine fasciolosis around Bahir Dar D. V. M. These, Adiss Ababa University, F. V. M., Debrezeit, Ethiopia.
- [14] Fischer. M. S. and Raspsay. R. 1989. Manual on tropical veterinary parasitology. The Ruminants. The merck veterinary manual, seventh edition. Merck and co. Inc. Raahways, N. J., U.S.A., Pp. 1832.
- [15] Graber. M. 1995. Helminth and helminthiasis of domestic and animal in Ethiopia. Rev eleven. Med. Vet pays. Trop. Vol. 1: Pp 13-95.
- [16] Jones. T. C., Hunt. R., D., King. N. W. 1996. Veterinary pathology, 6<sup>th</sup> ed, santa FC, NewMexico Southborough, Massachusetts.
- [17] Jorgen. H. and Brain. P. 1994. the epidemiology, diagnosis and control of helminth Parasite of ruminants. A hand book. Rome: Food and agricultural organization of the United Nation. Pp. 72.
- [18] Kaufman. J. 1996. parasitic infection of domestic animals, a diagnostic manual. Berlin Germany, Ciba-Geigy. Pp. 6-8.
- [19] Kendall. S. 1954. fasciolosis in Pakistan. Ann. Trop. parasit. Vol. 48: Pp. 307-313.
- [20] Markos. T. 2002. Effect of Triclabendazole (Fascinex) on acute fasciolosis in sheep in Central highland of Ethiopia. Bull. Anim. HLth. Prod. Afr. 48: 87-92.
- [21] Mitchel. G. B. B. 2003. Treatment and control of liver fluke in sheep and cattle Technical notes November. Sac 2003. West main road, Edinburgh.
- [22] Ollerenshaw. C. B. 1971. some observations on the epidemiology of fascioliasis in Relation to the timing of molluscicide applications in the control of the disease. Veterinary Record 88, 152-164.
- [23] Payne. W. J. A. 1990. An introduction to animal husbandary in tropics, fourth edition. Black Well, science. Oxford. London. Pp. 47-74.
- [24] Rahmato. A. 1992. Fasciolosis: Clinical occurrence, coprological, abattoir and snail Survey in and around Walliso. D. V. M. thesis. F. V. M. Debrezeit Ethiopia.
- [25] Reineke. R. K. 1983. Veterinary helminthology. Butter works. Durban professional Puplicishers, PTY. Ltd. Pp. 250-258.
- [26] Rokni. M. B., Massound. J. and Kia. E.. B. 2003. Comparision of adult somatic and cystine Proteinase antigen of fasciola gigantic in enzyme linked linked Immunosorbent Assay For diagnosing of bovine fasciolosis, OIE seminar on biotechnology, proceeding November 9-13, Techran, Iran.
- [27] Rowcliff. S. A. and Ollen shaw. C.. B. 1996. observation on the bionomics of the egg of Fasciola hepatica. Ann. Trop. Med. Parasite Vol. 54. pp. 172-181.
- [28] Sloss. M. W., Kempt. R., Anne. M., Z.. 1978. Veterinary clinical parasitology. 5<sup>ed</sup> ISBN. Pp 20-21.
- [29] Smyth. D. 1994. Introduction animal parasitology, 3<sup>rd</sup> ed. Cambrdge University press. UK. Pp. 203-212.
- [30] Soulsby. E. J. L. 1982. Helminth, arthropods and protozoa of domesticated animals. seventh edition, Baliare Tindall, London, UK. Pp. 40-52.
- [31] SPSS (Statistic Programme for social scinence) for windows 10.0. 1999. SPSSInc. Chicago.
- [32] Thrushfield. M. 1995. Veterinary epidemiology second edition, University of Edinbergh, Blackwell Science. Pp. 180-188.
- [33] Troncy. P. M. 1989. Helminth of and poultry in tropical Africa. In: Fisher (1989). Manual Of tropical veterinary parasitology. CAB international UK. Pp. 63-73.

- [34] Urquhart. G. M., Armour. J. D., Duncan. J. L. and Jening. F. W. 1989. Veterinary Parasitology. Low priced ed. English language book societ longman, Black well. Pp. 286.
- [35] Urquhart. G. M., Armour. J. L., Duncan. L., Dunn. A. M. and Jening. F. W. 1996.. Veterinary parasitology. 2<sup>nd</sup> ed. Blackwell, London. Pp. 103-113.
- [36] VEIN. 2004. sheep health and prodaction. Post graduate foundation in veterinary science Of University of Sydney. Pp. 508.
- [37] Wassie. M. 1995. Prevalence of bovine and ovine fasiolosis: A preliminary survey in Nekemt and its surrounding area. D. V. M. Thesis, A. A. U. Debrezeit, Ethiopia.
- [38] William. F. J. 1997. Veterinary parasitology reference manual. 4<sup>th</sup> ed. Washington state. Pp. 5-7.
- [39] Yadata. B. 1994. Epidemiology of bovine and ovine Fasciolosis and distribution of its Snail intermediate host in wesrern Shoa. D. V. M Thesis., F. V. M. A. A. U. Debrezeit, Ethiopia.
- [40] Yilma,. J. 1985. Economic significance of bovine Fasciolosis: An assesement trial at Debrezeit government abattoir. 2<sup>nd</sup> student scientific journal. F. V. M, A. A. U. Debrezeit, Ethiopia. Pp. 47.
- [41] Yilma,. J. M. and Malone. J. B. 1998. A great geographic information system fore cast model For strategic control of fasiolosis in Ethiopia. Vet. Parasitology. Vol. 78: Pp. 103-127.
- [42] Dunn AM (1978) Veterinary Helminthology. 2nd ed. Bulter and Tanner, Ltd. London.
- [43] Radostits OM, Blood DC, Gay CC (1994) Atext book of disease ocattle, sheep, goat, pigs and horse. Vet Med 8th ed, 1015-1026.