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Prevalence of Fascioliasis in Sheep in Jumla District, Nepal

Dr Ramesh Prasad Sah
Sheep and Goat Research Program, Guthichaur, Jumla, Nepal

Corresponding Author:
Dr Ramesh Prasad Sah
Sheep and Goat Research Program, Guthichaur, Jumla, Nepal

rpsnarc@gmail.com

Abstract
Fascioliasis is an economically important zoonotic disease of domestic livestock, especially cattle, buffalo, sheep, goat, horses, donkeys, rabbits, wild ruminants and humans. A cross-sectional investigation on fascioliasis was carried out for six months in sheep of different places of Jumla to determine prevalence of fascioliasis in sheep as well as to assess the major associated risk factors and its economic significance. Altogether 200 fecal samples (100 in March and 100 in June month) were collected randomly and tested for presence of eggs of Fasciola. Similarly, antemortem inspection and slaughtered sheep were examined in 30 sheep for abnormality. Deeply study was conducted for about fascioliasis and postmortem of 17 dead sheep was examined to see presence of liver fluke (*Fasciola*) in liver and gall bladder. Major risk factors were identified and analysis was done from obtained data. Prevalence of fascioliasis in sheep was found 34% in fecal test, 6.7% in slaughtered sheep and 23.5% in post mortem examination. Mature fluke was present in liver and gall bladder of inspected sheep. Additionally, major risk factors of diseases were identified and economic significance was assessed. This prevalence found in the study area could be due to the marshy and water-logged swampy area which is suitable for the breeding of intermediate host (snail). Integrated approach, which is a combination of selective chemotherapy and selective vector control, should be considered more practically and economically feasible.

Keywords: Fascioliasis, sheep, prevalence, risk factors, Jumla

I. Introduction

Fascioliasis is an economically important zoonotic disease of domestic livestock, especially cattle, buffalo, sheep, goat, horses, donkeys, rabbits, wild ruminants and humans. Fascioliasis is one of the important parasitic diseases in tropical and subtropical countries which limit productivity of ruminants (Mulatu and Addis, 2011). The disease is caused mainly by two species of parasitic Trematodes that affect the liver and other associated organs. The disease is caused by digenean trematodes of the genus Fasciola, commonly referred to as liver flukes. Liver flukes belong to the group of food borne Trematodes infection and are zoonotic (World Health Organization, 2016). The two species most commonly implicated as the etiological agents of fascioliasis are *Fasciola hepatica* and *Fasciola gigantica* (family Fasciolidae), are similar and large enough to be visible to the naked eyes (Centres for Disease Control and Prevention, 2013). Both species are transmitted in livestock by the snails of the family Lymnaeidae with potentiality to acute and chronic infection with expected blood loss of about 0.2–0.5 ml/worm/animal/day (Khan et al., 2009, 2011; Nguyen et al., 2017).

Species of the genus Fasciola cause important economic losses due to liver spoilage, high morbidity rates and reduced production of milk, meat and wool (Mas-Coma et al., 2005). Infestation with fascioliasis is usually associated with grazing wet land and drinking from the snail infesting watering places (Payne, 1990). Liver fluke infection in lambs and kids is characterized by anemia, edema, weight loss and death (Kassaye, 2011; Yilma and Malone, 1998). The fluke lifecycle requires intermediate host (snail) to complete transmission to a new ruminant host. The liver is damaged and condemned and the subclinical and chronic disease usually results in decrease production of meat, milk and wool, secondary bacterial infection, fertility problems, and great expenses with antihelminthics (Daryani et al., 2005). The disease causes considerable economic impact due to mortality, liver condemnation, reduced weight gain (up to 20%) and reduced quality and quantity (3–15% loss) of milk production (Piedrafita et al, 2010). Human fascioliasis is considered as a neglected tropical disease (Mas-Coma et al., 2014) affecting approximately 50 million people worldwide (Nyindo and Lukambagire, 2015). *F. hepatica* was reported in 45 years old woman in Nepal tested by Endoscopic Retrograde Cholangiopancreatography (Sah et al., 2017). Fascioliasis includes biliary colic, with vomiting, persistent diarrhea, jaundice and a tender hepatomegaly with peripheral eosinophilia (40-85%). Infection occurs following the ingestion of the encysted cercariae (metacercaria) of the fluke commonly found in water-cress. The temperature, rainfall and altitude of the study area are also favorable for the development of the intermediate host and Fasciola species (Sah et al., 2019).

In Himalay region sheep is considered as important commodity. The sheep contributes about 0.6% (2,766 Mt) to the total meat production (456,430 Mt) in Nepal and wool production is 399,432 kg as well as population of sheep is about 652,742 in number (Krishi Diary 2026). Farmers are keeping all the animals in group and they are not so much aware about deworming and vaccination due to diversified geographical areas. They do not get actual income or return from their animals. They are somewhat far from treatment and medicines in time. As a result, they lost their animals due to unavailability of medicines and technicians in time.

Although in past, few studies have already reported the prevalence of fascioliasis in different animals from many parts of Nepal (Sah et al., 2018, 2019; Mahato and Harrison, 2000; Joshi 1988), no concerted efforts have been made to study about this disease in Guthichaur. However, prevalence and data of this disease in sheep has rarely been documented. Hence, we determined to carry out the prevalence study on fascioliasis as well as to assess the major associated risk factors and economic significance of fascioliasis in sheep in Jumla.

II. Materials and Methods

Description of the study area



Figure 1. Map of Jumla district showing studied site depicted with red color in rectangle

The experiment was conducted at and around our farm, Sheep and Goat Research Program, situated at Guthichaur Rural Muncipality ward no. 2, Jumla District, Karnali Province, Nepal (Figure 1) and is located at 19 Km far from District head quarter (Chandannath/ Khalanga) Jumla. The flock of farm comprised of 350 animals including goats. Study location was situated in mountainous region and altitude ranges from 2500-3000 (avg 2700) meter above sea level.

Table1. General information about Guthichaur

Rainfall:	755 mm (June-Sep: 85%)
Temperature:	Max.27.3°C to Min. -5.7°C
Snowfall:	December to March
Relative humidity:	60-84%
Sunshine hour:	9.3 hrs in winter
Latitude:	29.15^0 N
Longitude:	82.2^0 E
Elevation:	2700 masl (meter above sea level)

Farmers raised sheep, goats, cattle, horses as semi-intensive type of management. Sheep and goats remain as intensive during snowfall (December to March). Sheep were supplied with hay and concentrates in our farm. Majority of farmers offered leaves of fodder trees and seasonal grasses found in pasture as feed. Sheep were taken to high altitude Majhpatan and other pasture lands for grazing in summer and rainy seasons as free range system. Only limited farmers provided with local feed materials like maize, crop residues etc to sheep.

Maize, Barley, bean, potato, wheat, buck wheat, millet and finger millet usually dominate the cropping pattern. Almost all the farmers have the practice of growing only one crop in a year. Apple is the popular temperate fruit followed by walnut, peach and plums.

Study Design and sampling techniques

A cross-sectional investigation on ovine fascioliasis was carried out from February (Falgun), 2024 to July (Saun), 2024 for six months in different farms. Animals of farm were not dewormed from four months. They were being fed with hay and concentrate. A total of 200 fecal samples (100 samples in March and 100 samples in June) were collected randomly to examine the internal parasitic eggs especially of *Fasciola* and nematodes. Altogether 30 sheep (not appropriate for farm due to inbreeding) were culled and were sold to nearby farmers for meat purpose. These sheep were observed closely for ante mortem inspection and slaughter time inspection in farmers' house. Additionally, 17 sheep died in different time and performed post mortem.

Faecal sample examination: Fecal samples were collected per rectum from the sheep. Each samples of 5-10 g of fecal material was collected in clean polythene bag containing 10% formalin as preservative. The samples were properly labeled and brought to Animal hospital Jumla as well as the laboratory of our farm, Guthichaur. The samples were tested microscopically for the presence of fluke (*Fasciola*) eggs using sedimentation technique as described by Soulsby, 1983. At least three smears were prepared for each sample. Presence of one or more fluke egg in a sample was considered as positive. To differentiate eggs of *Paramphistomum species* and *Fasciola species*, a drop of 1% methylene blue solution was added to the sediment. Eggs of *Fasciola species* show yellowish color, while eggs of *Paramphistomum species* was grey.

Ante-mortem examination: Complete ante mortem examination of the animals were carried out prior to slaughter. Inspection of the animals were made while at rest or in motion for any obvious sign of disease.

Inspection during slaughter: Farmers of nearby office of Guthichaur purchased and slaughtered 30 sheep in different time for meat purpose. Close observations were made visually for abnormalities in visceral organs like liver, gall bladder, lungs, heart etc during slaughter.

Post mortem examination: During post-mortem inspection, each liver was visually inspected, palpated and incised based on routine meat inspection procedure developed by FAO (2000). All condemned liver due to infestation by *Fasciola species* was registered and collections of flukes were conducted for the purpose of species identification.

Situation of pasture and surroundings: In order to know the major risk factors, following data were recorded. Situation of pasture land as well as surroundings were assessed. Hay house, feeding techniques, housing system and other managerial works were observed.

Data management and analysis: All the obtained data were compiled and enter into Microsoft Excel. Microsoft Excel database system was applied for data analysis. The prevalence of ovine fascioliasis was calculated as the number of infected individuals divided by the number of individuals sampled x 100. Statistical significance was set at $P < 0.05$ or less to determine whether there are significant differences between the parameters measured between the groups. Risk factors were assessed and interpreted.

III. Results

Examination of faecal samples: Out of 200 faecal samples examined, an overall prevalence of 68 (34%) were found positive for Fascioliasis in the study area Table 2.

Table 2. Prevalence of fascioliasis in sheep by fecal examination

Month	No of sheep observed	No of sheep positive	$\chi 2$ statistic	$p < .05$
March	100	56% (56)	23.2527	< .00001
June	100	12% (12)		
Total	200	34% (68)		

Ante mortem examination: All the 30 sheep were examined before slaughter and found no any clinical signs of fascioliasis like poor body condition, bottle jaw etc.

Inspection during slaughter: Out of 30 sheep slaughtered by farmers in different days, 2 sheep (6.7%) were found infected with liver fluke. From visual inspection of different viscera, enlarged liver alongwith fluke was detected in two sheep. Gall bladder of those two sheep were also enlarged.

Post mortem examination: Post mortem was performed in 17 dead sheep within six months study period. Among them 4 sheep (23.5%) were found positive for liver fluke infestation (Table 3). Infested liver was enlarged and presence of *Fasciola* in incised liver (Figure 2). Liver fluke looks like leaf shape. Remaining 13 animals died due to other causes like kid mortality, kid killed by dog, accident and other causes.

Table 3. Presence of *Fasciola* into Liver and bile duct of sheep by PM

Month	No of dead sheep	Presence of fluke into liver
February	5	1
March	4	2
April	1	0
May	2	1
June	2	0
July	3	0

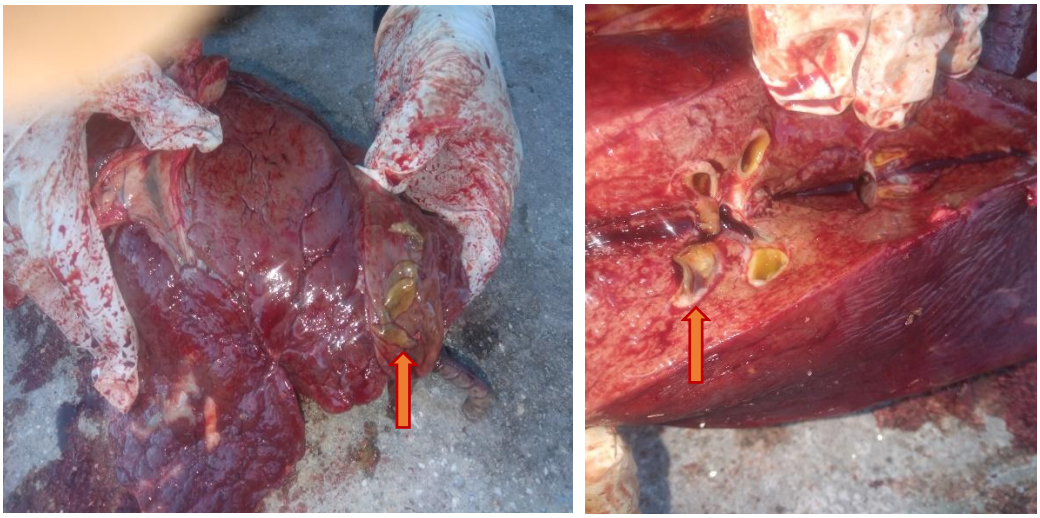


Figure 2. Presence of *Fasciola* parasite (leaf shape) in liver and duct indicated by arrow sign

Assessment of risk factors: Observed associated risk factors for fascioliasis in sheep in the farm are given below: Situation of pasture and surroundings: Lower part of pasture land was marshy and water-logged swampy area. Sometimes sheep were run there for grazing. Grasses were cut, prepared hay and stored in hay house for lean or winter season. It was found that feeding and housing of sheep were in four pens/sheds.

Medication with anthelmintic drugs

Mass medication of sheep was conducted in April and June with anthelmintic drugs. Dipping and vaccination against FMD and PPR were carried out in all animals in April-May.

Economic significance: Economic losses observed in sheep by fascioliasis are as follows:

Loss/death of animals from acute, subacute and chronic form
Production loss due to anaemia/ blood loss
Hamper in growth due to indigestion problem created by infested liver
Rapid loss of body condition/ weight and poor fleece quality despite adequate flock nutrition

IV. Discussion

Fascioliasis is a wide spread ruminant health problem causing huge direct and indirect loss in Nepal. In this study, the overall prevalence of ovine fascioliasis was 34%. This observation was similar to observation 35% in sheep and goat made by Shrestha 1996. The observed prevalence is relatively low from previous studies conducted by Alemu and Hailu (2020); Zeleke et al., 2013; Bogale et al., (2012); Atanaw and Atanaw (2012); and Bitew et al., (2010) who reported between 39-52.6% in Ethiopia. The prevalence of fascioliasis recorded in the present study was higher than the previous report of Ahmed et al., (2007) being 13.2% in the middle Awash River basin.

The prevalence of the disease in the study area might be attributed to the favorable ecological factors for snails (intermediate host) and the parasite.

Prevalence of ovine fascioliasis was found significantly higher in March than June (P=< .00001). This might be due to feeding of hay infested with metacercaria to sheep and sheep were confinement in shed during winter season. They were not drenched with dewormer from 4-5 months. Whereas prevalence was low in June because sheep were left in pasture land for grazing especially in upland as well as also performed mass drenching with oxyclozanide.

Different farmers bought 30 culled sheep (not appropriate for breeding in our farm) and slaughtered and found liver fluke positive in two cases. These two sheep might be infested with immature fluke during deworming in farm. All sheep were drenched with oxyclozanide and this drug is generally effective against mature fluke.

By post mortem examination, four dead sheep had destroyed and enlarged liver infested with *Fasciola* and also *Fasciola* present in gall bladder/ bile duct. Those sheep were died due to chronic stage of fasciola infestation. They were not treated with dewormer. The infestation may come from hay feeding or infection remained in them from several months.

Analysis of major risk factors for ovine fascioliasis:
Lower part of pasture land was marshy and water-lodged swampy area. As reported by Heinonen et al., (1995) water logged and poorly drained areas with acidic soils in the highlands are often endemic areas for fascioliasis. In summer and rainy season, several animal species like cattle, buffaloes, horses, goats and sheep are gathered every year from different places of different districts in pasture land for grazing. Bringing animals is tradition here. So these animals also act as major risk factor for contamination of pasture. Such animals do not have any shed and they are kept as free range system. Such animals excrete parasitic eggs in pasture and thus pasture or grazing area becomes infested with different parasites. Due to marshy and water-logged swampy area, liver fluke eggs get snail population and cercaria as well as metacercaria developed. The whole pasture becomes infested with metacercaria by movement of animals. The grasses of that pasture is collected and prepared hay and stored in hay house for use in winter season. In winter season, surrounding areas are covered with snow for four months. In this way infested hay is used as feed in that period. Sheep are kept in whole time in shed except 1-2 hours in a day for feeding concentrate and for sunbath. So confinement of animals in shed is major risk factor for fascioliasis.

Adult flukes can survive for many years in the livers of infected hosts and lay between 20,000 and 50,000 eggs/day. Animals grazing in wet marshy areas, favored the intermediate host, are more likely to become infected. Typically, long and wet seasons are associated with a higher rate of infection. However, sheep are more likely to ingest large numbers of cysts during dry periods following a wet season. This is due to a reduction in available pasture, forcing the animals to graze in swampy areas or in areas where the water has receded, thus exposing them to vegetation heavily infected with metacercaria (Scott and Goll, 1997).

Sheep of our farm goes to whole pasture land for grazing. They consume directly cercaria as well as metacercaria during grazing and drinking. So pasture land is also considered as risk factor. As this place is regarded as tourist place. Many people come to visit and do entertainment in surrounding areas. Their movement also transfer metacercaria from one place to other and our boundary get contaminated. That is why visitors also considered as risk factor.

Economic significance:

Liver fluke causes three types of disease - acute, sub-acute and chronic depending upon the level of challenge and the animals' resilience. Sudden deaths may affect up to 10 percent of sheep at risk causing grave financial loss. Fascioliasis can have a serious financial impact on a sheep farm with immediate losses of up to 10 percent caused by the acute or subacute form of disease. Chronic disease could halve profits by reducing the lamb crop and increasing ewe mortality. Fluke is the second highest cause for abattoir condemnations. The damage from fluke has a huge effect on rapid loss of growth rate, milk yield, finish weights, poor fleece quality and poor meat quality.

Conclusion and Recommendations

The result of the present study by post mortem and fecal examinations, indicated that fascioliasis was a highly prevalent sheep disease in the study area. However, it is increasingly evident that a proper evaluation of the epidemiology of fascioliasis is lacking. The relatively high prevalence reported in this study has clearly indicated lack of strategic control measures against the disease as well as poor awareness knowledge about this disease in the community. This prevalence found in the study area could be also due to the marshy and water-logged swampy area which is suitable for the breeding of intermediate host (snail). Based on current conclusion the following recommendations were forwarded:

Integrated approach, which is a combination of selective chemotherapy and selective vector control, should be considered more practically and economically feasible.

Supplementation of important nutrient feed in dry season is important to avoid stress conditions that affect the host resistance and susceptibility to parasitic diseases.

Awareness creation to livestock owners need to be performed with economic significance and control methods of this disease in surrounding areas.

In order to design and implement control strategy, detailed study should be conducted on the risk factors of the disease.

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References

[1] Mulatu H, Addis M. 2011, Study on the Prevalence and Risk Factors of Ovine Fasciolosis in Small Ruminants in and Around Hirna Town, Ethiopia *Global Veterinaria 7*: 497-501.

[2] World Health Organization, 2016. Food borne trematode infection – fascioliasis. Retrieved from:. *www.who.int/foodborne_trematode_infections/fascioliasis/en/.*

[3] Centres for Disease Control and Prevention. 2013. *www.cdc.gov/parasites/fasciola/biology.html*.

[4] Khan MK, MS Sajid, MN Khan, Z Iqbal, M Arshad and A Hussain. 2009. Bovine fasciolosis: Prevalence, effects of treatment on productivity and cost benefit analysis in five districts of Punjab, Pakistan. *Res. Vet. Sci. 87:* 70– 75.

[5] Khan MK, MS Sajid, MN Khan, Z Iqbal, M Arshad and A Hussain. 2011. Point prevalence of bovine fasciolosis and the influence of chemotherapy on the milk yield in a lactating bovine population from the district of Toba Tek Singh, Pakistan. *J. Helminthol. 85*: 334 – 338.

[6] Nguyen NT, TC Le, MD CoVo, HV Cao, LT Nguyen, KT Ho, QN Nguyen, VQ Tran and Y Matsumoto. 2017. High prevalence of cattle fascioliasis in coastal areas of Thua Thien Hue province, Vietnam. Available from: *https://www.researchgate.net/publication/316602991*.

[7] Mas-Coma, S., Bargues, M.D., Valero, M.A., 2005. Fascioliasis and other plant-borne trematode zoonoses. *International Journal for Parasitology 35*, 1255–1278.

[8] Payne, W., 1990. *An introduction to animal husbandry in the tropics, Black well science*. Oxford. London, 4: 47-74.

[9] Kassaye, A., 2011. Prevention of Lamb and kid mortality.In.Ethiopia Sheep and Goat Productivity Improvement program (ESGPIP). *Tech. Bull., No.46*.

[10] Yilma, J., Malone, J.B., 1998. A geographical information System forecast model for strategic control of fasciolosis in Ethiopia. *Vet. Parasitol., 78 (2),* 103-127.

[11] Daryani A, Alaei R, Arab R, Sharif M, Dehghan MH, Ziaei H (2005). Prevalence of liver fluke infection in slaughter animals in Ardabi Province, Northwestern Iran. *J. Anim. Vet. Adv. 5*:408-411.

[12] D. Piedrafita, T.W. Spithill, R.E. Smith, and H.W. Raadsma, 2010. Improving animal and human health through understanding liver fluke immunology, *Parasite Immunol, 32(8)*, 572–81.

[13] S. Mas-Coma, M.D. Bargues, and M.A.Valero, 2014. Diagnosis of human fascioliasis by stool and blood techniques: update for the present global scenario, *Parasitology, 141(14),* 1918–46.

[14] M. Nyindo, and A.H. Lukambagire, 2015. Fascioliasis: An Ongoing Zoonotic Trematode Infection, *BioMed Research International, Article ID 786195,* 8 pages, http://dx.doi.org/10.1155/2015/786195.

[15] Ranjit Sah, Shusila Khadka , Mohan Khadka , Dipesh Gurubacharya, Jeevan Bahadur Sherchand , Keshab Parajuli , Niranjan Prasad Shah , Hari Prasad Kattel , Bharat Mani Pokharel and Basista Rijal. 2017. Human fascioliasis by *Fasciola hepatica*: the first case report in Nepal. *BMC Res Notes 10*:439.

[16] Ramesh Prasad Sah and Ram Babu Sah. 2019. Prevalence of Fascioliasis in Goat in Sunsari District, Nepal. *International Journal of Veterinary Science and Agriculture Research Volume 1 Issue 3*,pp 9-15.

[17] Ramesh Prasad Sah, Hari Kumar Prasai , Jiban Shrestha , Md Hasanuzzaman Talukder , AKM Anisur Rahman and Ram Bali Sah. 2018. Seasonal and Altitudinal Prevalence of Fascioliasis in Buffalo in Eastern Nepal. *Journal of Nepal Agricultural Research Council Vol. 4*: 48-53.

[18] Mahato SN, LJS Harrison and JA Hammond. 2000. Overview of Fasciolosis- an economically important disease of livestock in Nepal. *https://pdfs.semanticscholar.org/9a49/a8405f9fc0b7e3a9e5d431d459f83362874a.pdf.*

[19] Joshi BR. 1988. Prevalence of Fascioliasis (Liverfluke) in cattle and buffaloes in the Mid-western hills of Nepal. *J. Inst. Agri. Anim. Sci. 9(1):* 111-114.

[20] E.J.L. Soulsby, 1983. *Helminths, Arthropods and Protozoa of Domesticated Animals, 7 th edition*, Lea and Febeiger, Philadelphia, USA, 763–777.

[21] FAO. 2000. Manual on meat inspection for developing countries. *FAO Anim. Prod. Health Paper 119*. Rome. Italy.

[22] Abayneh Alemu and Seifu Hailu 2020. Prevalence of Ovine Fasciolosis in Wolayta Sodo, Southren Ethiopia. *J Dairy Res Tech 3*: 013.

[23] G. Zeleke, S. Menkir, M. Desta. 2013. Prevalence of ovine fasciolosis and its economic significance in basona worana district, central Ethiopia. *Scientific Journal of Zoology 2(8),* 81-94.

[24] Basaznew Bogale, Abeje Mandefro and Mersha Chanie 2012. Pervasiveness of Fasciolosis in Sheep in Yilmana-Densa District, West Gojjam Zone, Amhara Region, Northwestern Ethiopia. *Acta Parasitologica Globalis 3 (3)*: 34-37.

[25] Mastewal Birhan Atanaw and Malede Birhan Atanaw 2012. Study on ovine fasciolosis: Prevalence and associated risk factors in North Gondar Zone, Ethiopia. *Journal of Veterinary Medicine and Animal Health Vol. 4(8)*, pp. 105-109.

[26] Molalegne Bitew, Nuradis Ibrahim and Nahili Abdela 2010. Study on the prevalence of Ovine fascioliasis in and around Dawa-Cheffa, Kemissie. *African Journal of Agricultural Research Vol. 5(19),* pp. 1-5.

[27] Ahmed, E.F., K. Markvichitr, S. Jumwasorn, S. Koonawoothtthin and J.S. Achoothesa, 2007. Prevalence of *Fasciola species* infections of sheep in the middle awash river basin, Ethiopia. *Southeast Asian Journal of Tropical Medicine and Public Health, 38*: 51-52.

[28] Heinonen, M., G. Pute and S. Kebede, 1995. The effect of anti-parasitic treatment against fasciolosis on cross breed and Zebu Cows in Ethiopia. *World Review of Animal Production, 82*: 40-46.

[29] Scott JM, Goll PH (1997) The Epidemiology and Anthelmintic Control of Ovine Fasciolosis in Ethiopian Central Highlands. *British Veterinary Journal 133*: 273-280.