

Prevalence of Gastrointestinal Parasites of Somali Back Head Sheep (*OVIS ARIES*) of Wadajir and Karaan Districts in Mogadishu, Somalia

Mohamed Ibrahim Abdi - Soojeede¹

Jobkey University, School of Agriculture and Veterinary Science, Zebo Road, Near Hotel Shamo, Wadajir District, Mogadishu, Somalia

Abstract: *The prevalence of gastrointestinal parasites is a main cause of production loss in sheep. This study was conducted to know the prevalence of gastrointestinal parasites of Somali back head sheep in Wadajir and dharkeynley district, Somalia. Also evaluated considering sex. Materials and methods: Laboratory examination of Fecal sample was carried out at Wadajir and Karaan districts from January 2019 to April 2019. In total, 73 rectal fecal samples of sheep were collected and were examined for the presence of eggs and oocytes by using direct smear and counted by using quantitative techniques. Eggs/oocysts/cysts were identified according to their characteristic features. Result: The overall prevalence was 83.6% that means 61 samples were positive, and 12 samples were negative of gastrointestinal parasites and also there is mixed parasitic infections having more than two parasites in one sample, 43 samples were mixed with (59%). In the present study *Coccidia* spp (protozoan) and *Monezia* spp (trematoda) were found to be the superior parasites recorded in all the 61 positive samples. having *Coccidia* spp (protozoan) , 39(63.93%) and *Monezia* spp (trematoda) 28(45.90%), the second highest groups were all nematode with percentage *Haemonchus* spp 22(36.06%), *Trichostrongylus* 10(16.39%), *Strongyloides* 8(13.11%) and *Trichuris* Spp 2(3.28%),. Whereas the lowest sample was *Dictyocaulus* spp (Nematode) and *faciola* spp (Trematoda), having percentages 1(1.64%) irrespectively. so the result had P value or Sig. (2-tailed) = .000 which means the test is significant. Researchers recommended as the Animal owners must get full awareness of how to control, treat and feed good quality folder and water to prevent the gastrointestinal parasites in themselves and their animals. Government must make regular deworming campaign to reduce prevalence rates of parasites.*

Keywords: Somali sheep, parasites, Prevalence, Gastrointestinal

1. Introduction

Somali have specific breed of sheep which is known as Somalia black head sheep, the feature of this sheep is black head and white body, the tip of tail is short but the base of the tail is flat (fat deposit it), docile, short wool, some of them have horn but commonly not have horn except male sheep has when reach old. The Somali sheep originated from Persian, but today only Somali people have this breed.

Somali sheep, which are kept as pastoralists in rural, agro-pastoralists in villages of cultivated farms and small holders in urban communities, Somalia sheep kept as traditional way both Pure and mixing farming (which means husbanding both goats and sheep), the total number of sheep are three times less them the number of goats. Sheep representing an important sources of animal fats, also Somali people used their meat and fat as traditional remedy.

As we known, Parasites constitutes one of the most important constraints to small ruminant production in Somalia. It is responsible for mortality and weight loss in small holder's sheep and effects productivity and marketability. Thus still there is no research which presented and lists the common parasites of Somali sheep in Mogadishu, so this study was to determine the Prevalence of gastrointestinal Parasites on sheep in Mogadishu, Somalia..

2. Literature Review

The Gastrointestinal parasites are one of the most present challenges to livestock, and their intensity and distribution will be influenced by kind of season [1]. season is very importance for the distribution of gastrointestinal parasites of sheep, In Somalia we have four different seasons (Gu; Haga, Deyr and Jilal), two raining seasons such as Gu and Deyr, also two dry seasons such as Haga and Jilal. So the time researcher started examination of gastrointestinal parasites of sheep was Gu season, (Gu is the largest rain season in somalia).

Gastro-intestinal parasitic infection is one of the major health problems in the world reported that particularly nematode infections affect the health of millions of people and animals, causing huge economic loss in livestock farming. (Ethiopian). The gastrointestinal parasites can cause reduction and loss of production of shoats, if not given treatment and prevention they can cause death. Some small ruminant parasites have directly related to human and can be seriously to human health (zoonosis), [2].

The sheep parasitic Infection can transmit commonest via ingestion by the host and live either at the mucosal surface of the gastrointestinal tract or cross the mucosal barrier on their way to their preference site, the Eggs, oocytes or larvae can follow directly to the feces (Mucahy et al., 2004)[3]. Taylor, M. A. (2012) found that the main perceived driving forces is climate change, which can have profound effects on parasite epidemiology, especially for those parasitic diseases where weather has a direct effect on the development of free-living stages [4].

The variation in the prevalence of parasites depends upon the differences in the agro-climatic conditions and availability of the susceptible host (Singh et al., 2017) [5]. Environmental factors such as agroecological zones, temperature and rainfall patterns are very important in the hatching of viable eggs and development of parasite (Ratanapob et al., 2012) [6]

3. Methodology

3.1 Study design

The method of this study was descriptive research with using lab technician for studied current common of gastro-intestinal parasites of sheep in Mogadishu Somalia. The time was from January 2019 to April 2019. Target population was took sample 90 Somali black head sheep but selected 73 of them instead of 90, researcher used sample calculation of Confidence Level 95% and Confidence Interval 5%.

3.2 Study area

The study area was Mogadishu, which is the capital city of Somalia, Somalia located in horn of Africa and Mogadishu located in Benadir region, the Benadir has seventeen districts. Two districts were included in this study such as Karaan and Wadajir. These districts have smallholders are common areas sheep present.

Wadajir district is one of the districts located along with the coast in Mogadishu Benadir region. While karaan is one of the corner district located in near beach in east of Mogadishu Benadir region, but researcher collected sample to both districts irrespective of villages within it. Because number of sheep was very small than goat.

3.3 Study population

The study population was Local Somali black head sheep, (*Ovis Aris*), of smallholders in two the districts Karaan and Wadajir in Mogadishu Somalia. So researcher made collection of feces and examined for the presence of eggs or oocysts of gastro-intestinal parasites.

3.4 Sample collection

Researcher has collected sample of feces of Somali black head sheep, Researcher collected fecal sample at the rectum using plastic gloves temporary stored in fecal container. For that container researcher wrote date, place, and sex of animal for identification method and transported the fecal container to the laboratory Room in University campus.

3.5. Examination of sample

The Examination procedure was Coprological examinations [7] which include methods, Direct Smear Fecal Exam as

Table 3: Prevalence of Nematode parasites

Nematode parasites								
Sex				Dictyocaulus	Strongyloides	Trichuris	Haemonchus	Trichostrongylus

mentioned Johannes Kaufmann 2013, but little simplified [8]. Light microscope was used to proof eggs and oocytes of parasites, with 10x or 40x objective magnification.

3.6. Data analysis

The data analysis was used quantitative methods and Researcher listed all parasite eggs and Oocytes, research made tables and graphs e.g. percentage, and classified with base on district and sex, presented variation in both types, Researcher used significance P value, with one sample t test. The data was stored and analyzed by using SPSS – statistical Package for social science (Version 16).

4. Result

Table 1: District, sex and Positive prevalence

District * type of sex? * parasite presence Crosstabulation				
Sex				
	District		Male	Female
	N	Positive +	Positive +	Positive +
Karaan	43(58.90%)	36(49.4%)	17(27.87%)	19(31.15%)
Wadajir	30(41.10%)	25(34.2%)	14(22.95%)	11(18.03%)
Total	73 (100%)	61(83.6%)	31(50.82%)	30(49.18%)

Source: Primary data

The researchers selected two districts Karaan and Wadajir in Mogadishu because this two districts have large number of household who have kept sheep in small scale, and built pens. In table 01; showed 43(58.90%) of the samples were obtained from Karaan District, 36(49.4) were positive samples, and 30(41.10%) of the sample taken from Wadajir District, 25(34.2%) were positive samples. The total prevalence percentage was 61(83.6%) out of 73 (100%). The negative samples were 12 (16.4%). Whereas sex type of sheep and positive level of them were founded 31(50.82%) of positive samples were took from male sheep in two districts (Karaan 17(27.87%) and Wadajir 14(22.95%) and 30(49.18%) positive sample were took from female sheep in districts (Karaan 19(31.15%) and Wadajir 11(18.03%). This indicates that highest number of male sheep was in Karaan District and lower in Wadajir district in one sample respectively of positive samples.

Table 2: Mixed parasites in positive samples

Mixed parasites in positive samples			
	N	Mixed parasite	Percentage %
Karaan	43	24	32.90%
Wadajir	30	19	26.10%
Total	73	43	59%

Source: Primary data

A total of 73 fecal samples of sheep were collected from two Districts (Karaan and Wadajir). Those examined samples revealed positive was include mostly some sample which consists more than one parasite, which is known as mixed samples. In table 02; the mixed samples was 43 (59%) out 61(83.6%) of the total positive samples.

M	District	Karaan	17	1(1.64%)	1(1.64%)	0(0.0%)	5(3.05%)	1(1.64%)
		Wadajir	14	0(0.0%)	3(4.92%)	0(0.0%)	5(3.05%)	2(3.28%)
F	District	Karaan	19	0(0.0%)	1(1.64%)	2(3.28%)	6(9.84%)	5(3.05%)
		Wadajir	11	0(0.0%)	3(4.92%)	0(0.0%)	6(9.84%)	2(3.28%)
Total			61	1(1.64%)	8(13.11%)	2(3.28%)	22(36.06%)	10(16.39%)

Source: Primary data

Dictyocaulus is lungworm mostly affected in ruminants. Adult *D. viviparus* worms reside in the bronchia of the animal's lungs, then enters into gastro-intestinal passes through feces.[9] It was found the prevalence of Dictyocaulus is 1.64% of the gastro intestinal parasites. This shows the prevalence of Dictyocaulus is one of the lowest rate in the area. *Trichuris* worms not common diseases as clinical cases, but Adult whipworms live and feed on the mucosa of the large intestine (cecum). So, this parasite was showed having 3.28% of the sample was found *Trichuris* which shows second low prevalence rate when compared to parasites.

Strongyloids was common parasites in all ruminates, as researcher have gotten in goat, it has prominence feature that differentiated it to other parasite, Eggs shell is very transparent and embryo (worm) shows little movement within egg. 8(13.11%) of the sample were Strongyloides which indicates that the prevalence of Strongyloides in sheep is same in both Karaan and Wadajir district. Haemonchus is parasite causing severe infection on sheep and goat, it effects physical appearance of animals [8]. So researcher find the prevalence rate of this parasite (Haemonchus), 22(36.06%) of total positive samples.

Finally, the last nematode worm seen in samples was Trichostrongylus, Trichostrongylus is parasite in sheep and goat are common to come in subclinical form or have mild Symptoms. Trichostrongylus in sheep was reached its prevalence rate 10(16.39%) of the total positive samples.

Table 4: Trematoda and Cestoda and Protozoa

Trematoda and Cestoda and Protozoa						
Sex		N	Fasciola	Moniezia	Coccidia	
M	District	Karaan	17	0(0.0%)	8(13.11%)	12(19.67%)
		Wadajir	14	1(1.64%)	8(13.11%)	7(11.48%)
F	District	Karaan	19	0(0.0%)	9(14.75%)	12(19.67%)
		Wadajir	11	0(0.0%)	3(4.92%)	8(13.11%)
Total		61	1(1.64%)	28(45.90%)	39(63.93%)	

Source: Primary data

Fasciola is live fluke parasite that recently became seriously affecting human and domestic animal health, it can come acute and chronic form in all domestic animal, and it has special important in sheep because it is most common definitive host [8][10].

Prevalence of fasciola in sample were 1(1.64%) out of 61(83.6%) of the total positive samples, it was male sheep present only Wadajir not in Karaan District. So it's second lowest worm when compared to others. Moniezia 28(45.90%) out of 61(83.6%) of the total positive samples. Male sheep (8(13.11%) in Karaan Districts and 8(13.11%) in Wadajir), Female sheep (9(14.75%) in Karaan and 3(4.92%) in Wadajir District).

And the last Parasites Coccidia, and is protozoan parasites which was common all species not only in sheep, Coccidia, 39(63.93%) out of 61(83.6%) of the total positive samples. Male sheep (12(19.67%) in Karaan Districts and 7(11.48%) in Wadajir), Female sheep (12(19.67%) in Karaan and 8(13.11%) in Wadajir District). So Moniezia and coccidian was the highest parasites found in sheep when compared to other parasites.

Table 5: Significance P Value

One-sample test						
Test value = 3						
	T	df	Sig. (2-tailed)	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Type of sex?	-24.933	72	0	-1.466	-1.58	-1.35
District	-27.405	72	0	-1.589	-1.7	-1.47
Parasite presence	-42.026	72	0	-1.836	-1.92	-1.75
Mixed parasite	-27.405	72	0	-1.589	-1.7	-1.47
Dictyocaulus	-74	72	0	-1.014	-1.04	-0.99
Strongyloides	-30.14	72	0	-1.11	-1.18	-1.04
Trichuris	-53.405	72	0	-1.027	-1.07	-0.99
Haemonchus	-24.065	72	0	-1.301	-1.41	-1.19
Trichostrongylus	-28.059	72	0	-1.137	-1.22	-1.06
Fasciola	-74	72	0	-1.014	-1.04	-0.99
Moniezia	-24.144	72	0	-1.384	-1.5	-1.27
Coccidia	-26.098	72	0	-1.534	-1.65	-1.42

Source: Primary data

This table 05 presented P value of all data in SPSS using one-Sample t test. Researcher had test value 3, so the result had P value or Sig. (2-tailed) = .000 which means the test is significant, because researcher used the rule below, If P > 0.05 the test is not significant (the sample is not significantly different than $\mu = 3$). In conclusion, the analysis of the of sample test showed that the dominant answer of that questions are significance no difference.

5. Discussion and Conclusion

This study investigated the prevalence of gastrointestinal Parasites on Somali sheep in Mogadishu Somalia, with the sample size of with the sample size of 73, the overall prevalence was 83.6%, that means 61 samples were positive, and 12 samples were negative of gastrointestinal parasites and also there is mixed parasitic infections having more than two parasites in one sample, 43 samples were mixed with (59%).

In the present study *Coccidia spp* (protozoan) and *Moniezia spp* (trematoda) were found to be the superior parasites recorded in all the 61 positive samples. having *Coccidia spp* (protozoan), 39(63.93%) and *Moniezia spp* (trematoda)

28(45.90%), the second highest groups were all nematode with percentage *Haemonchus spp* 22(36.06%), *Trichostrongylus* 10(16.39%), *Strongyloides* 8(13.11%) and *Trichuris Spp* 2(3.28%),. Whereas the lowest sample was *Dictyocaulus spp* (Nematode) and *faciola spp* (Trematoda), having percentages 1(1.64%) irrespectively.

This indicates sheep are more prevalence of *Coccidia spp* (protozoan) and *Monezia spp* (trematoda) than goat. Sheep not have clinical sign of infection firstly until parasite propagation increased. The analysis of the of sample test showed that all data was significance no difference, because the result had P value or Sig. (2-tailed) = .000 which means the test is significant.

Researcher advised to make study of anti-parasites resistance of sheep to identify reason sheep has more parasites in his GIT (gastrointestinal tract). And also try to study the perception of animal owners on gastrointestinal parasites and its effects.

6. Recommendation

Recommendation is very useful to stakeholders and animal owners of sheep, gastrointestinal parasites was revealed high prevalence in sheep, it has direct connection to the human and other animals which is possible to transmit human (zoonotic parasites like faciola) and animals. Researchers recommended as following

- Animal owners must get full awareness of how to control gastrointestinal parasites in themselves and their animals.
- Animal own must learn how to treat regularly diseased animals
- Animal owners must feed in his animal good folder and clean water.
- Government or other International Agency must make regular deworming campaign to reduce prevalence rates of parasites.

The government or other International Agency must establish diseases surveillance system to detect new cases in high number.

7. Acknowledgements

Researcher would like to thank Rector of Jobkey University Prof; Abdiaziz Agane Abdisamad, Academic Director, Eng Mohamed Hassan Takow. And Admin & Finance; Mr. Abdullahi Agane Abdisamad, researcher acknowledged Jobkey University for the funding this study. This study was made possible through the help of students graduating this year (2018/2019) of veterinary medicine at Jobkey University (like Daud, Falastin, Leyla, and Fatuma).

References

[1] Biffa, D., Jobre, Y., & Chakka, H. (2006). Ovine helminthosis, a major health constraint to productivity of sheep in Ethiopia. *Animal Health Research Reviews*, 7(1-2), 107-118.

- [2] Abdi-Soojeede, M.I. (2018) Common Gastro-Intestinal Parasites of Goats (*Capra aegagrus hircus*) from Mogadishu, Somalia. *Open Journal of Veterinary Medicine*, 8, 232-240. <https://doi.org/10.4236/ojvm.2018.812020>
- [3] Mulcahy, G., O'Neill, S., Donnelly, S., & Dalton, J. P. (2004). Helminths at mucosal barriers—interaction with the immune system. *Advanced drug delivery reviews*, 56(6), 853-868.
- [4] Taylor, M. A. (2012). Emerging parasitic diseases of sheep. *Veterinary parasitology*, 189(1), 2-7.
- [5] Singh, E., Kaur, P., Singla, L. D., & Bal, M. S. (2017). Prevalence of gastrointestinal parasitism in small ruminants in western zone of Punjab, India. *Veterinary world*, 10(1), 61.
- [6] Ratanapob, N., Arunvipas, P., Kasemsuwan, S., Phimpraphai, W., & Panneum, S. (2012). Prevalence and risk factors for intestinal parasite infection in goats raised in Nakhon Pathom Province, Thailand. *Tropical animal health and production*, 44(4), 741-745.
- [7] Leland S. Shapiro; Patricia Mandel (22 May 2009). *Pathology & Parasitology for Veterinary Technicians*. Cengage Learning. pp. 237–239. ISBN 978-1-4354-3855-2. Retrieved 11 September 2011.
- [8] Kaufmann, J. (2013). *Parasitic infections of domestic animals: a diagnostic manual*. Birkhäuser.
- [9] Hansen, J., & Perry, B. D. (1994). *The epidemiology, diagnosis and control of helminth parasites of ruminants. A handbook*.
- [10] Valero, M. A., Perez-Crespo, I., Periago, M. V., Khoubbane, M., & Mas-Coma, S. (2009). Fluke egg characteristics for the diagnosis of human and animal fascioliasis by *Fasciola hepatica* and *F. gigantica*. *Acta tropica*, 111(2), 150-159.

Author Profile



pathology.

Dr. Mohamed Ibrahim Abdi –Soojeede, received the Bsc DVM. And M.S. degrees in HSM from Kampala University in 2014 and 2017, respectively. During 2018-2019, I was stayed in Jobkey University (JU), School of agriculture and Veterinary science, I was senior lecturer of Veterinary Parasitology, Veterinary