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Extended Abstract
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Epidemiological Study of Small Ruminant Cryptosporidium Infection in Ziway Dugda District of East Arsi Zone, Ethiopia

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Abstract

This study was undertaken to determine the prevalence and intensity of small ruminant Cryptosporidium infection and to investigate the role of potential risk factors associated with the occurrence of the in the district of Ziway dugda in the eastern area of arsi, Ethiopia. Faecal samples were collected from 174 sheep and 210 goats under the age of one year. Samples were analysed using the sheather's sugar solution flotation technique and Modified Ziehl–Neelsen staining technique. 59 samples were found positive giving an overall prevalence of 15.4%. Significant difference (P<0.05,) was observed in the prevalence of small ruminant Cryptosporidium infection among poor, medium and good body condition animals (p-value=0.004), and in between diarrheic and non- diarrheic animals (p-value=0.002). However, all the risk factors considered in this study had no significant effect (p- value>0.05) on the prevalence of Cryptosporidium infection. Regarding the intensity of the infection, 31 samples (8.1%) were scored as "high," 17 (4.4%) were scored as "moderate," and 11 (2.9%) were scored as "low," while the remaining 325 samples (84.6%) were "negative". The intensity of Cryptosporidium infection is significantly higher in small ruminants having poor body condition (p-value=0.038) and diarrhea (p-value=0.025). This study demonstrated the importance of Cryptosporidium infection in small ruminants less than one year of age and having diarrhea and poor body condition in Ziway dugda district of east arsi zone, Ethiopia.

Keywords: Cryptosporidium; Small ruminants; Prevalence; Intensity; Ziwaydugda

Materials and Methods

Study area: The study was conducted from November 2017 to April 2018 in Ziway dugda district, East Arsi zone of Oromia regional state, Ethiopia.The area is located 221 km southeast of Addis Ababa, the capital of the country and 46 km from Asella, the capital of the eastern area of Arsi. The district is in the great rift valley of Ethiopia. Ziway dugda district has an area of 1269.07 km2 with 31.7% is arable or used for crop cultivation, 6% of pasture, 46.3% forest and the remaining 16% is swampy, mountainous or unusable. Topographically, the district is tropical in nature located between 8° 05'N-8°25' N latitude and 39°E39°45' E longitudes at an altitude of 1600 to 1800 m above sea level with the minimum and maximum temperature 19°C and 32°C respectively. The district receives an average annual rainfall ranges between 650 to 800 mm, with bimodal rainfall March to April (short rainy season) and July to October (long rainy season). Estimated animal population in the area is about 124,680 cattle, 24,524 sheep, 40,286 goats, 17,851 equines and 60,345 chickens.

Study population and study protocol: A total of 384 small ruminants consisting of 156 males and 228 females were examined for Cryptosporidium infection, out of which 174 were sheep and 210 goats. Furthermore, 112 of the study animals were found diarrheic but the rest 272 were non-diarrheic. All of the animals in the study were local breeds kept under extensive management system and had not received any anticryptosporidial medication prior to sampling. The study was conducted using clinical and laboratory examinations techniques. During the clinical examination, the species, sex, age and body conditions of the study animals were recorded. All clinical findings, particularly GIT syndromes, were recorded and fecal samples were collected from each animal for coprology. Laboratory examination was conducted by sheather's sugar solution flotation technique and Modified Ziehl–Neelsen staining technique for Cryptosporidium. To ease statistical analysis, the animals were classified into three age groups: 0- 1 month (very young), 1 month- 6 months (young) and 6 months-1 year (young adult). The animals were also classified as poor, moderate and good based on the appearance of their body condition and manual palpation of the spines and transverse processes of lumbar vertebrae as described by Morgan et al. The age of sheep and goats were determined based on owners' response and using dentition.

Conclusion:

Cryptosporidium is prevalent among small ruminants less than one years of age in the study district. The study clearly showed variations in Cryptosporidium prevalence and intensity among the risk factors identified for the individual animal. A higher proportion of infection and greatest oocyst excretion is detected in poor body conditioned diarrheic goats and sheep less than one month age. Conclusively, cryptosporidiosis is very common in diarrheic goat kids and lambs having poor body condition. This study emphasizes the isolation of diarrheic goat kids and lambs during the course of the diarrhea and other possible control strategies aimed at minimizing transmission between the sources of the organism i.e., diarrheic goat kids and lambs and other animals at risk.

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