

## **Prevalence of Gastrointestinal Parasites of Rams brought into Abeokuta Small Ruminants Markets in Preparation for a Festive Season**

Oyewusi, I. K., Takeet, M. I., Olugbogi, E. I., Takeet, O. V. A and Talabi, A. O

<sup>1</sup>Department of Veterinary Medicine and Surgery, <sup>2</sup>Department of Veterinary Microbiology and Parasitology, Federal University of Agriculture, Abeokuta.

**Corresponding Author:** roye69@yahoo.com

**Target audience:** Sheep farmers, Sheep traders, Veterinarians, Health workers

### **Abstract**

*In an effort to gain a better understanding into the role played by food animals in the epidemiology of gastrointestinal parasites, we assessed the prevalence of gastrointestinal parasites in different breeds of rams brought into Abeokuta during a festive season by microscopic examination of faecal samples. A total of 206 rams of different breeds were randomly sampled. The faecal samples collected were subjected to simple floatation and sedimentation tests. McMaster egg counting technique was used to estimate the faecal oocyst load in positive samples. Overall prevalence of gastrointestinal parasites was 51.46%. There was significant ( $p < 0.05$ ) difference between the prevalence of *Eimeria* spp (37.38%) and helminth eggs (13.59%). Among the 29 samples that tested positive for helminth eggs, 6 (20.7%), 19 (65.5%) and 4 (13.8%) were cestode, nematode and trematode eggs, respectively. The genera of nematodes eggs identified include *Strongyloides* spp, *Haemonchus* spp, *Mashallagia* spp, *Bunostomum* spp, *Ascaris* spp, *Dictyocaulus* spp, *Gongylonema* spp and *Ostergia* spp; trematodes were *Fasciola* spp and *Dicrocoelium* spp while cestodes were *Moniezia* spp and *Avitellina* spp. The only protozoan parasite identified was *Eimeria* spp. This study has clearly shown that rams brought to Abeokuta during festive seasons carry different gastrointestinal parasites of which *Eimeria* spp had the largest share. Parasites of zoonotic importance (*Fasciola* and *Moniezia*) were also detected. Therefore, there is need for regular screening of animals being introduced from one state to the other and also from neighbouring countries for effective monitoring and control of parasitic diseases in domestic animals and human population.*

**Keywords:** GIT parasite, ram, helminth, protozoan.

### **Description of Problem**

Parasitic diseases are a major constraint to livestock production and development in the developing countries (1, 2) including Nigeria particularly where animal welfare is taken with levity. The important livestock in

Nigeria include cattle, sheep, goat and poultry. Although pig production is taken seriously in some parts of the country pork is not generally accepted as others because of religious and traditional believe. In sub-Saharan Africa, sheep provide almost 30% of the

meat consumed and around 16% of the milk produced but contributes about 50% of the total domestically produced meat in Nigeria. Aside the production of meat for the populace, sheep has been the favored animal in the production of a special delicacy commonly called 'suya' (a roasted form of mutton) and the only acceptable sacrificial animal during the Muslim festival called Eid el Kabir.

In Nigeria, sheep production suffers economic losses as a result of gastrointestinal parasites. The losses are in forms of stunted growth, lower weight gain, lowered fertility, involuntary culling, treatment costs and mortality in heavily parasitized animals (3, 4). Environmental factors, nutritional factors and vector population have been incriminated in the distribution of most parasitic diseases. Gastrointestinal parasites are worldwide but most prevalent in the tropics where sanitation and nutrition standards are generally poor (5). During festive periods, ruminants, especially sheep are brought into Abeokuta from different parts of Nigeria and neighboring countries through transhumant routes without any form of quarantine check. Many of these sheep may be carrying all form of endo- and ecto-parasites which are not present in Abeokuta and Nigeria.

The prevalence of gastrointestinal parasites and their loads in the faecal samples of small ruminants has been studied extensively in Nigeria (6, 7, 8, 9, 10). But there is no data on the occurrence and prevalence of gastrointestinal parasites and loads in the faeces of rams brought into the Abeokuta market for sales during Eid el Kabir celebration. Hence, this study

aimed to provide information on the occurrence and prevalence of gastrointestinal parasites in the rams brought into various markets in Abeokuta metropolis during festive season (Eid el Kabir celebration).

## **Materials and Methods**

### ***Location of study***

The study was conducted in two major small ruminants markets (Eleweran-alalubosa and Lafenwa) in Abeokuta metropolis in Ogun State. The markets are located at the outskirts of the city and are about 10 km apart. These markets enjoy the influx of small ruminants from the Northern part of Nigeria and neighbouring countries such as Niger Republic and Republic of Benin. An average of 50 and 100 rams are brought in daily almost a month to the day of celebration in Eleweran-Alalubosa and Lafenwa market respectively.

### **Sample collection and analysis**

A total of 206 faecal samples were collected from rams of different breeds (Uda, Yankassa, West African Dwarf and Balami). Faecal samples were collected from the rectum using gloved fingers into universal bottles. The samples were preserved on ice and taken to the Parasitology laboratory of the Department of Veterinary Microbiology and Parasitology, Federal University of Agriculture, Abeokuta.

The faecal samples were examined by simple floatation technique for cestodes, nematodes and protozoan oocyst as described by (11). Sedimentation technique was used for the detection of trematode eggs. Those samples that

were positive for coccidial oocysts were further subjected to McMaster egg counting technique for estimation of faecal egg load as described by (12). The eggs of different parasites were identified based on the morphological features, size and colour differences (13). Based on quantitative examination (oocyst per gram of faeces), the degree of infestation was categorized as light, moderate and massive. Egg counts from 50-799, 800-1200 and over 1200 per gram of faeces were considered as light, moderate and massive infestation, respectively.

#### **Data analysis**

The data were summarized using descriptive statistics. Prevalence of gastrointestinal parasite eggs in relation to classes and genera were compared.

#### **Results and Discussion**

A total of 206 rams were examined for gastrointestinal parasites through faecal examination. The breeds included Yankassa, Uda and Balami. Of the animal sampled, 106 were infected with one or more species of helminths and protozoan parasites indicating overall prevalence of 51.46%. The 77 (37.38%) prevalence of protozoan parasites (*Eimeria* spp) was significantly higher ( $p < 0.05$ ) than 29 (13.59%) recorded for helminth parasite eggs in this study. Among the helminthes, nematodes had the highest prevalence (10.68%), followed by cestodes (2.40%) and the least was trematodes (1.94%) (Table 1)

These include *Strongyles* spp (8.25%), *Strongyloides* spp (4.85%), *Fasciola* spp (1.46%), *Paramphistomum* spp (0.49%), *Moniezia* spp (2.91%) and

*Avitellina* spp (0.49%). While the only protozoan parasite identified was *Eimeria* spp (37.38%) (Figure 1) Oocyst counts of *Eimeria* spp revealed that 43%, 12% and 22% of the rams were found to be lightly, moderately and massively infected.

Rams are brought in majorly, from different parts of Northern state in Nigeria and the neighbouring countries to Abeokuta, Ogun State without any form of quarantine check.

The high prevalence of 51.46% recorded in this study could not be compared due to lack of any data on gastrointestinal parasites of rams only. But when compared with records of prevalence in sheep generally (males and females); the result was in agreement with the 53.97% reported in Abuja (14) and 53.3% reported in Pakistan (15) but lower than 98.2% reported in Ghana (2). The disparity in the prevalence might be due to the differences in geographical locations, climates, management systems and nutritional conditions of the animals. However the relatively high prevalence reported in this study may be a pointer to the fact that parasitic infections are a major factor limiting the profitable production of sheep all over the world, particularly where nutrition is low and sanitation standards are generally poor such as seen in developing countries.

From this study, *Eimeria* spp, *Strongyle* spp, *Strongyloides* spp and *Moniezia* spp were the most recorded parasites observed and this agreed with the reports of (16, 17, 18, ); who have variously reported that the most pathogenic GIT parasites of small ruminants were *Strongyle* spp, *Strongyloides* spp

**Table 1:** Gastrointestinal parasites burden in the rams brought in to Abeokuta during festive season

	Protozoa	Helminthes		
	Eimeria oocyst	Cestode	Nematode	Trematode
Number Positive (%)	77 (37.38%)	7 (3.40%)	22(10.68%)	4 (1.94%)
Number Negative (%)	129 (62.62)	199 (96.60%)	184(89.32%)	202(98.06%)
Total	206 (100)	206 (100)	206 (100)	206 (100)

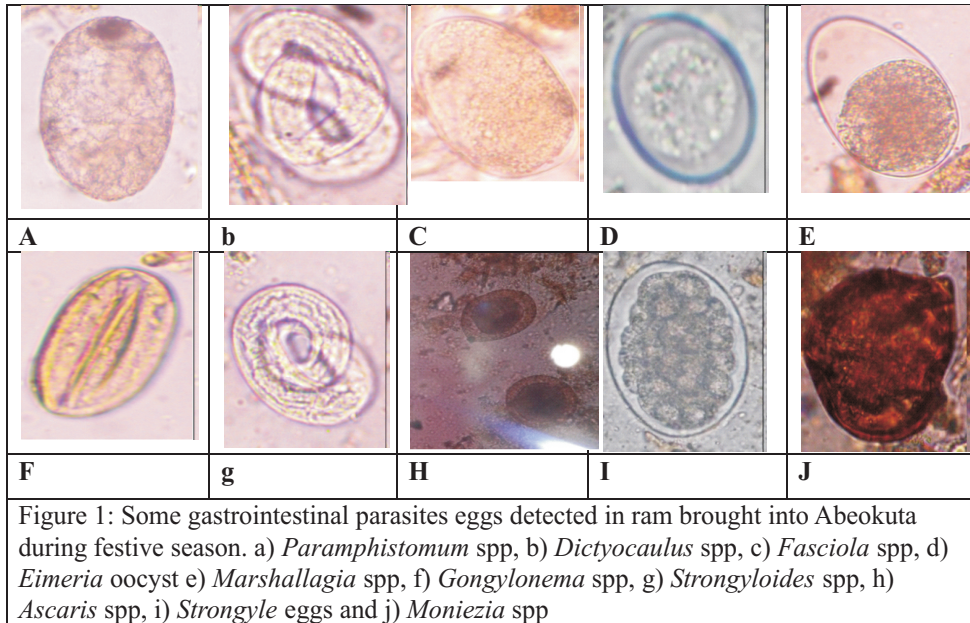


Figure 1: Some gastrointestinal parasites eggs detected in ram brought into Abeokuta during festive season. a) *Paramphistomum* spp, b) *Dictyocaulus* spp, c) *Fasciola* spp, d) *Eimeria* oocyst e) *Marshallagia* spp, f) *Gongylonema* spp, g) *Strongyloides* spp, h) *Ascaris* spp, i) *Strongyle* eggs and j) *Moniezia* spp

and *Eimeria* spp. However, the prevalence of each of the helminthes (*Strongyloides* spp (4.85%), *Strongyle* spp (8.25%), *Moniezia* spp (2.91%) and *Fasciola* spp (1.46%)) was lower than the prevalence (*Strongyloides* spp (9.5%), *Strongyle* spp (62.6%) and *Fasciola* spp (8.4%) reported by (19) in Tangail district, Bangladesh. The disparity in the prevalence of helminth parasites might be related to climatic conditions such as quantity and quality of pasture, temperature and humidity of the environment. The relatively low prevalence of each of the helminthes recorded in this study might also be due to the deworming medications owners

often administered to their animals in order to keep them in the best state of health before their arrival at the point of sale. The most prevalent of these parasites was *Eimeria* spp (37.38%) and this could be linked to unsanitary environment in the market places and stress that resulted from long journey, overcrowding, harsh weather conditions (rain or sunlight) and poor nutrition the animals are exposed to while on transit (20). The prevalence of protozoan parasites in the study agreed with the findings of (18) who reported a prevalence of 38.5% in goats in Ibadan but however, lower than 51.8% reported in Kumasi, Ghana (2).

The detection of *Fasciola* spp and *Moniezia* spp in this study calls for serious attention to parasitic infection of sheep as monieziasis is becoming an emerging zoonosis. Fascioliasis has been a regular occurrence in human around the world (21), while the first parasitic zoonosis of human Monieziasis was reported in a fifteen-year old shepherd boy in Egypt in 2014(22)

### Conclusions and applications

1. This study has clearly shown that rams brought to Abeokuta during festive season carry different gastrointestinal parasites including those that are of zoonotic importance (*Fasciola* and *Moniezia*).
2. There is need for regular screening of animals being introduced from one state to the other and also from neighbouring countries for effective monitoring and control of parasitic diseases in domestic animals and human population.
3. For good state of health of rams brought in during festive period, high sanitary standards should be practiced in the market places to reduce the incidence of coccidiosis and helminthosis.
4. Sheep farmers and traders should be educated on the need to minimize stress pose on animals during long distance transportation. This can be achieved by providing good loading vehicles, avoidance of overcrowding and breaking long

journey to allow for rest in holding yards.

5. Also farmers need to know that deworming only cannot take care of all gastrointestinal parasites; therefore coccidiostat should be administered alongside with dewormer,

### References

1. Ibrahim, N., Tefera, M., Bekele, M. and Alemu, S. (2014). Prevalence of gastrointestinal parasites of small ruminants in and around Jimma Town Western Ethiopia. *Acta Parasitol.* 5:26–32.
2. Owusu, M., Sekyere, J. O. and Adzitey, F. (2016). Prevalence and burden of gastrointestinal parasites of Djallonke sheep in Ayeduase, Kumasi, Ghana. *Veterinary World*, 9(4): 361-364.
3. Fikru, R., Teshale, S., Reta, D. and Yosef, K. (2006). Epidemiology of gastrointestinal parasites of ruminants in Western Oromia, Ethiopia. *International Journal of Applied Research Veterinary Medicine*, 1: 451-457
4. Waller, P. J. (2006). From discovery to development: current industry perspectives for the development of novel methods of helminth control in livestock. *Veterinary Parasitology*, 139: 1-14
5. Schmidt, G.D., Roberts, L. S. and Janovy, J. (2000). *Foundation of Parasitology*. McGrawhill, Boston, Massachusetts, Science. p.670.
6. Fakae, B. B. and Chiejina, S. N. (1993). The prevalence of

- concurrent trypanosome and gastrointestinal nematode infections in West African Dwarf sheep and goats in Nsukka area of eastern Nigeria. *Veterinary Parasitology*, 49 (2-4): 313–318.
7. Nwosu, C. O., Ogunrinade, A. F. and Fagbemi, B. O. (1996). Prevalence and seasonal changes in the gastro-intestinal helminths of Nigerian goats. *Journal of Helminthological*. 70(4): 329 – 333.
  8. Nwosu, C. O., Madu, P. P. and Richards, W. S. (2007). Prevalence and seasonal changes in the population of gastrointestinal nematodes of small ruminants in the semi-arid zone of north-eastern Nigeria. *Veterinary Parasitology*, 144 (1-2): 118-124.
  9. Anene, B.M., Onyekwodiri, E. O. Chime, A. B. and Anika, S. M. (1994). Gastrointestinal parasites in sheep and goats of southeastern Nigeria. *Small Ruminant Research*, 13 (2): 187–192.
  10. Okaiyeto, S. O., Tekdek, L. B., Sackey A. K. B. and Ajanusi, O. J. (2008). Prevalence of Haemo and Gastrointestinal Parasites in Sheep Kept by the Nomadic Fulanis in Some Northern States of Nigeria. *Research Journal of Animal Sciences*, 2: 31-35.
  11. Urquhart, G. M., Armour, J., Duncan, J. L. and Jennings, F. W. (2007). *Veterinary Parasitology*. 2<sup>nd</sup> edition, Longman group, UK. 22, pp 123-126
  12. Soulsby, E. J. L. (1986). *Helminthes, arthropods and protozoa of domesticated animals*. 7<sup>th</sup> edition, London, UK, Bailliere, Tindall, pp 1-78
  13. Foreit, W. (1999). *Reference Manual of Veterinary Parasitology*. 5<sup>th</sup> edition, Wiley Blackwell, New York, USA. p. 22-26.
  14. Solomon-Wisdom, G. O., Matur, B. M. and Ibe, K. C. (2014). Prevalence of Intestinal helminth infection among sheep and goats raised for slaughtering in Gwagwalada abattoir, Abuja, Nigeria. *Journal of Global Pharmaceutical Sciences*, 2 (1): 12-19.
  15. Gadahi, J. A., Arshed, M. J., Ali, Q., Javaid, S. B. and Shah, S. I. (2009). Prevalence of Gastrointestinal parasites of sheep and goat in and around Rawalpindi and Islamabad, Pakistan. *Veterinary World*, 2(2): 51-53.
  16. Nwigwe, J. O., Njoku, O. O., Odikamnor, O. O. and Uhuo, A.C. (2013). Comparative study of intestinal helminthes and protozoa of cattle and goats in Abakaliki metropolis of Ebonyi State, Nigeria. *Advances in Applied Science Research*, 4 (2): 223-227.
  17. Emiru, B., Ahmed, Y., Tigre, W., Feyera, T. and Deressa, B. (2013). Epidemiology of gastrointestinal parasites of small ruminants in Gechi District, Southwest Ethiopia. *Advances in Biomed. Research*. 7: 169-174.
  18. Adejinmi, O. O., Adejinmi, J. O., Falohun, O. O., Aderaju, O. P. and

- Dauda, W. J. ( 2015). Prevalence of gastrointestinal parasites of goats in Ibadan, Southwest, Nigeria. *World Journal of Agricultural Research*, 3(2): 49-51.
19. Sangma, A., Begum, N., Roy, B. C. and Gani, M. O. (2012). Prevalence of helminth parasites in sheep (Ovisaries) in Tangail district, Bangladesh. *J. Bangladesh Agricultural University*. 12(2):235-244
20. Smith, M. C. and Sherman, D. M. (1994). *Goat Medicine*. Lippincott Williams and Wilkins, Philadelphia, PA. p. 312-318.
21. Mramba, N. and Abdul-Hamid, L. (2015). Fascioliasis: An Ongoing Zoonotic Trematode Infection. *BioMed Research International* 2015, 8 pages <http://dx.doi.org/10.1155/2015/786195>
22. el-Shazly A. M., Morsy, T. A. and Dawoud, H.A. (2004). Human Monieziasis expansa: the first Egyptian parastic zoonosis. *Journal of Egypt Society of Parasitology*, 34 (2): 515 -518.