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Distribution of Eimeria infection in Cattle in Yola Metropolis

Yaro Mathew[1], *Wurma James Gambu*[2], *Iliyasu Koskos*,[3] *Kamaludee Mohammed*[4]
Department of Biology, School of Science, College of Education Hong, Adamawa State Nigeria[1,2,3,4]

Correspondence: *gmyarobirdling@yahoo. Com*[1]

Abstract
Faecal samples collected from 410 cattle of various age groups, breeds and sexes were screened for different Eimeria (E.) species based on sporulated oocysts. Out of the 410 faccal samples examined, 145(35.4%) were positive for Eimeria oocysts of one or more species. A total of 9 different Eimeria species including E. auburensis (23.4%), E. bovis (19.3%), E. zuernii (14.5%), E.cylindrica (11.0%),E. subspherica (11.7%), E. ellipsoidalis (9.0%), E. bukidnonensis (5.5%) E. illinosensis (4.8%) and E. alabamensis (0.7%) were encountered. Yearlings were more commonly infected 170(51.0%) than calves 131 (29.0%) and adults 109(20.0%). The prevalence was higher in males 276 (65.5%) than in females 134(34.5%). The highest prevalence was in Sokoto-Gudali (36.6%) followed by Friesian (29.6%), and the least was in White-Fulani breeds (4.8%). It was concluded that there could be clinical outbreak of Eimeria infections in the area with respect to the high occurrence of pathogenic species.

Keywords: Eimeria infections; sporulated occysts, faecal samples, yearlings and Sokoto-Gudali

Introduction

Eimeria infection is a serious disease that results in health and economic problems in several classes of livestock Foster, A.0 (2000). In the case of cattle, the disease commonly affects younger ones up to 2 years of age Andrews, A.H., Blowey, E.W., Boyd, H. and Eddy, G.H. (2004). Bovine coccidiosis is caused by several species of Eimeria of which E. zuernii and E. bovis are generally rated as significantly pathogenic. In us alone the annual estimated loss from Eimeria infections in cattle has been put $400 million Matjila, P.T and Penzhorn, B.L. (2002). Death losses as high as 25% have been observed in weaning calves in severe outbreaks Fitzgerald, P.R. (2011). Although considerable research has been carried out so far on bovine coccidiosis in various parts of the country including Bauchi Fabiyi, J.P. and Bawa, H.B..(2013), Jos Platcau Lee, R.P. and Armour, J. (2000), Port Harcourt. Princewill, W.J. and Arnakoromo, A.E. (2016), and Ibadan Majaro, D.M. and Dipeolu, 0.0. (2000) but reports on cattle in sokoto in particular and northwest in general are few. To fill this gap, the present study was carried out to

investigate the prevalence of Eimeria affections in cattle in Yola for an insight into the possible role coccidiosis plays in cattle production in the area for the control strategies

Methodology

Study Area

The study was carried out in Yola metropolis, which is situated in the northestern part of Nigeria at 11°30"E; 4°N. it is located in the Sudan savannah vegetation belt with sandy soil and a humidity of below 40% years round. except during the rainy season when it rises to 60% Foster, A.0.(2000). The two dominant seasons are the wet and dry seasons. The summer begins in June and lasts up to September or October, while the winter begins in October and last up to May or June. The mean annual rainfall ranges between 500mm and I,300mm Hoeje, N.P. (2010).. Five farms were involved in the study, one belonging to the MAU and four others to the commercial firm. This study also included a few locally reared cattle. The breeds sampled were:- Fricsian, Friesian-Gudali, Muturu, Red-Bororo, Sokoto-Gudali and White Fulani, comprising yearlings, calves and adults, which were either intensively, semi-intensively or extensively managed.

Samples Collection

Faecal samples were collected from the randomly selected cattle, placed in polythene bags, indicating gross appearance and nature of the faeces as well as sex, age, and breed of animals. Thereafter they were transported to the Parasitology Laboratory of the University, for examination. The samples were kept at 4°C till examination which did-not exceed 30 hrs after collection. The study was conducted from March 2016 to June 2018.

Methods of Examination

Faeces were moistened with water and few drops of potassium dichromate and left for a week to peritsporulation of oocysts. Faecal samples were examined for sporulated oocysts using floatation method Soulsby, EJ.L. (2011) the saturated sodium chloride being the floatation medium.

Parasites Identification

This was based on morphological characteristics of sporulated oocysts such as the size, shape, presence or absence of micropyle, presence or absence of cap, oocyst polar granule, size of sporocysts body, thickness of wall and others as previously described and illustrated.

Results

A total of 410 faecal samples from cattle were examined for coccidial oocysts following sporulation in this study. The nicroscopic examination revealed 9 different species of Eimeria (Table I). Overall, 145 (35.4%) were positive for Eimeria oocysts of one species or more (Table 2). E. auburnensis had the highest prevalence of 34 (23.4%), followed by E. bovis and E. zuernii 19.3% and 14.5% respectively. Yearlings were more commonly infected 170(51.0%) than calves 131 (29.0%) and adults 109(20.0%), the differences being statistically significant ($p<0.001$). The prevalence was higher in males 276 (65.5%) than in females134 (34.5%), and the differences were again statistically significant ($p<0.001$), Highest prevalence was recorded in Sokoto-Gudali 166 (36.6%) followed by Friesian 70(29.6%), and the least was in White-Fulanibreed 30 (4.8%). Sokoto-Gudali showed highest rate of occurrence 166(36.6%). In this study, it was observed that yearlings were more commonly infected 170(51.0%) than calves 131 (29.0%) and adults 109(20.0%). Adult yearlings and calves did not show clinical signs of coccidiosis during this study. Most samples collected were well-formed facces; severe diarrhoca was not observed in any of the samples, however, soft faece seen sometimes were attributed to eating of green forage.

Table 1: Prevalence of Eimeria oocysts in the infect cattle in Yola Metropolis

Specie	N	(%)
E. Auburnensis	96	(23.4)
E. Bovis	79	(19-3)
E. zuernii	59	(14.5)
E. cylindrica	45	(11.0)
E. suspherica	48	(11.7)
E. ellipsoidalis	37	(9.0)
E. bukidnonensis	23	(5.5)

E. illinosensis	20	(4.8)
E. Alabmensis	3	(0.7)

Table 2: Prevalence of *Eimeri*a infections in cattle in Yola Metropolis in relation to age.

Age group	Total	N	(%)
Yearlings	170	74	(51.0)
Calves	131	42	(29.0)
adults	109	29	(20.0)
Total	410	145	(100)

Table 3: prevalence of *Eimeria* infections in cattle in Yola Metropolis in relation to sex

Sex	Table sample	N	(%)
Male	276	95	(65.5)
Female	134	50	(34.5)
Total	410	145	(100)

Table 4: prevalence of *Eimeria* infections in cattle in Yola Metropolis in relation to breed

Breed	Total sample	N	(%)
Friesian	70	43	(29.6)
Friesian-Gudali	67	20	(13.8)
Muturu	31	11	(7.6)
Red-Bororo	46	11	(7.6)
Sokoto-Gudali	166	53	(36.6)
White Fulani	30	7	(4.8)
Total	410	145	(100)

Discussions

This study demonstrated that cattle in Yola metropolis harbour a wide variety of *Eimeria* species as carlier reported in other part of Nigeria. No less than 7 species were recorded. The low

occurrence of *Eimeria* infection due to the acquisition of immunity in adults may be through previous infections Levine, N.D. and Ivens, V.(2012). Although the calves are susceptible they have only just started to cut grass the main source of infection, following feeding from milk negligible source of infection as advanced for sheep Mason, P. (2018). On the other hand susceptibility of yearlings to *Eimeria* infection could be due to their exposure during their feeding activity on grass.

The Friesian cattle, an exotic breed were more exposed than the local breeds especially the White Fulani and the Muturu and Bororo breeds. This is consistent with genuine breed differences in susceptibility to *Eimeria* infections. Exotic breeds bare kept under strictly controlled management systems with regular treatment against *Eimeria* infections while the indigenous stock under poorer management and no coccidiosis control programme have had more opportunity for natural selection. It is however possible that management is also a factor since Friesians are grazed intensively and thus more exposed to infections than the local breeds raised on free range and less exposed to infection Mason, P. (2018). The exception to this observation was the high prevalence in Sokoto-Gudali, undoubtedly due to the fact that almost all the animals in this group were yearlings the most frequently infected in this study.

The high occurrence of the infection in males compared to females may be due to the presence of male sex hormone which may enhance their susceptibility to the infection Ackert, J.E. and Dewhirst, L.W.(2017). This information is of value to both veterinarians and cattle owners as it clearly demonstrates both the sex and age groups had to receive more attention in order to prevent economic loss from bovine coccidiosis. It is to be noted that although only subclinical infections were seen in this study, there is potential for outbreaks of clinical infections if compounded by inter current diseases or nutritional deficiencies Ackert, J.E. and Dewhirst, L.W.(2017).

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