

## **Prevalence of Bovine Coccidial Infection in the Semi-Arid Region of Northeastern Nigeria**

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### **ABSTRACT**

A study was undertaken on the prevalence of coccidial infections of bovine in the semi-arid region of north-eastern Nigeria. Of the 147 bovine faecal samples examined, 108 (62.1%) had coccidial oocysts. According to breeds, however, no statistical variation ( $p>0.05$ ) existed in the prevalence of infection between the Wadara 99 (61.9%), White Fulani 5 (62.5%), Sokoto Gudali 2 (66.7%) or Crosses 2 (66.7%). Similarly, the prevalence of infection between male and female was not statistically significant ( $p>0.05$ ). Meanwhile, the younger age group of 1 - 3 years had significantly ( $p<0.05$ ) higher prevalence of infection than older groups of 4 - 6, and 7 - 9 years of age. From the foregoing, it is evident that high prevalence of coccidial infections existed in different breeds of cattle in the semi-arid region of north-eastern Nigeria and calves are more predisposed to the infection.

**Key words:** Bovine, coccidial oocysts, Maiduguri

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### **INTRODUCTION**

Bovine coccidiosis is a protozoan disease resulting from an infection with one or more species of *Eimeria* (Soulsby, 1982). All breeds of cattle are susceptible to the disease (Hungerford, 1975). Similarly; younger cattle below the age of one year are more predisposed to the infection than the older ones (Fraser, 1986). The disease occurs in all parts of the world and serious outbreaks may occur in younger stocks kept in large numbers (Ahmed *et al.* 1992; Nwosu, 1996; Nwosu, 1997; Radostitis *et al.*, 1997).

Economic losses due to bovine coccidiosis in other parts of the world have been estimated to occur in excess of two hundred million dollars (Fitzgerald, 1980).

In spite of the fact that the arid zone harbours 30% of the total (13.9 million) cattle population in the country (Bourn *et al.*, 1994), there is paucity of information on the coccidial infection of bovine in the area. This study was therefore designed to investigate the prevalence of coccidial infections among various breeds of cattle in the semi-arid region of north-eastern Nigeria.

### **MATERIALS AND METHODS**

#### ***Study area***

The study was conducted at the University of Maiduguri Livestock Farm, Maiduguri Cattle Market and few sedentary herds in Maiduguri Metropolis. The area lies between latitudes  $11^{\circ} 05' N$  and  $11^{\circ} 40' N$  and longitudes  $13^{\circ} 05' E$  and  $13^{\circ} 25' E$  and located within the semi-arid zone (Sahel savannah) characterized by a short rainy season of 3 - 4 months (June - September) followed by a prolonged dry season for the rest of the year (Udoh, 1981).

#### ***Sample collection and laboratory techniques***

Faecal samples were randomly collected from the rectum of 174 sedentary cattle of various breeds, different sexes and age groups using disposable hand gloves. The animals were aged based on dental formulae as suggested by Radostitis *et al.* (1997). The samples were subjected to the direct smear and floatation techniques using saturated sodium chloride solution as floating medium (Anon, 1977). The identification of the oocysts was done using standard parasitological criteria (Levine, 1973; Sloss and Kemp, 1978; Soulsby, 1982).

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### Statistical analysis

The student's *t*-test was used in pair wise comparison of prevalence rates and *p*-values less than 0.05 were considered significant (Mead and Curnow, 1983).

### RESULTS

The overall prevalence of bovine coccidial infection in the semi-arid region of north-eastern Nigeria is presented in Table 1. The overall prevalence of infection was found to be 62.1%. The infection rate of 79 (76.0%) in the younger age group of 1-3 years was found to be statistically significant ( $p < 0.05$ ) as compared to 16 (43.2%) and 13 (39.4%) among the older cattle of 4 - 6 and 7 - 9 years respectively. The infection rate of 35 (66.0%) among the males and 73 (60.3%) among the females was not statistically significant ( $p > 0.05$ ) as presented in Table 1.

**Table 1.** Age and sex distribution of bovine coccidial infection in the semi-arid region of northeastern Nigeria

Parameters	No. examined	No. positive	Frequency of infection (%)	
Sex	Males	35 <sup>a</sup>	66.0 <sup>a</sup>	
	Females	121	73 <sup>b</sup>	60.3 <sup>a</sup>
Age	1 - 3 years	104	79 <sup>b</sup>	76.0 <sup>b</sup>
	4 - 6 years	37	16 <sup>c</sup>	43.2 <sup>c</sup>
	7 - 9 years	33	13 <sup>c</sup>	39.4 <sup>c</sup>
All sexes/ages	174	108	62.1	

<sup>a,b,c</sup> superscripted values in columns between sexes or ages differed significantly ( $p < 0.05$ )

The prevalence of infection among various breeds of cattle examined is presented in (Table 2). The prevalence rate among the Wadara 99 (61.9%), White Fulani 5 (62.5%), Sokoto Gudali 2 (66.7%) and Crosses 2 (66.7%) did not show any significant statistical variation ( $p > 0.05$ ).

**Table 2.** Distribution of bovine coccidial infections among different breeds of cattle in the semi-arid region of northeastern Nigeria

Breed	No. examined	No. positive	Frequency of infection (%)
Wadara	160	99 <sup>a</sup>	61.9 <sup>a</sup>
White Fulani	8	5 <sup>b</sup>	62.5 <sup>a</sup>
Sokoto Gudali	3	2 <sup>b</sup>	66.7 <sup>a</sup>
Crosses	3	2 <sup>b</sup>	66.7 <sup>a</sup>
Total	174	108	62.1

<sup>a,b</sup> superscripted values in second column differed significantly ( $p < 0.05$ ) while <sup>a,a</sup> superscripted values in third column did not differ significantly ( $p > 0.05$ )

### DISCUSSION

The prevalence of bovine coccidial infection in the semi-arid region of north-eastern was found to be high. This is in agreement with earlier works conducted in goats in the area (Ahmed *et al.*, 1992) and among various domestic animals elsewhere in the world (Soulsby, 1982; Blood and Radostitis, 1989; Radostitis *et al.*, 1997) and in other geographical zones in Nigeria (Adewuyi *et al.*, 1989; Woji *et al.*, 1991). Coccidial infection however, does not invariably result in clinical disease, other factors such as the number of infecting sporulated oocysts, nutritional status of the host, presence of intercurrent disease and immunity contribute to the susceptibility to clinical coccidiosis (Ahmed *et al.*, 1992).

The highest infection rate was found to be chiefly confined to the younger age group of (1 - 3 years) which probably was associated to age susceptibility and lack of premunity as observed by several workers (Soulsby, 1982; Adewuyi *et al.*, 1989; Blood and Radostitis, 1989; Woji *et al.*, 1991; Ahmed *et al.*, 1992). Cyclical changes in females have previously been reported to be associated with lowered resistance to infection (Ahmed *et al.*, 1992). Contrary to this observation, however, no statistical variation was observed between sexes in the present study, which probably might have been associated with the significant variation in sample size for the sexes. Similarly, the various breeds were equally infected which suggests that breeds did not play a significant role on the prevalence of infection.

It is therefore suggested that good feeding practices, management and attention to the principles of animal sanitation with regular prophylactic dosages of sulfadimidine incorporated in feed may go along way in controlling the infection in sedentary cattle in the area.

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