

Studies on the coccidial species of livestock in Nigeria

I. — Preliminary observation on the prevalence of *Eimeria* species among a static herd of N'dama cattle

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RÉSUMÉ

Etudes sur les espèces de coccidies du bétail, en Nigeria :

I. — Observation préliminaire sur l'existence d'espèces d'*Eimeria* dans un troupeau fermier de N'Dama

A l'examen coproscopique de 296 bovins, 185 (soit 63 p. 100) ont été reconnus comme porteurs d'oocystes de coccidies. Neuf espèces ont été identifiées : *Eimeria bovis*, *E. auburnensis*, *E. bukidnonensis*, *E. ellipsoidalis*, *E. alabamensis*, *E. zurnii*, *E. canadensis*, *E. cylindrica*, *E. subspherica* et décrites. Dans la plupart des cas il s'est agi d'infections mixtes mettant en cause deux et même trois de ces espèces, sept animaux n'étant parasités que par une seule espèce. *Eimeria bovis* a été l'espèce prédominante et le plus souvent rencontrée (30 p. 100 des cas positifs).

INTRODUCTION

Bovine coccidiosis is common in Nigeria both among the native owned herds and Government cattle ranches.

The pathogenic effects of some species of *Eimeria* affecting these animals is of economic importance.

Bovine coccidiosis has been recognized and described by many authors (3, 6, 8) but only a few information is available in Nigeria. The only available report was that of LEE and ARMOUR (8), but unfortunately restricted their survey to Vom area in Plateau State of Nigeria.

The *Eimeria* species prevalent among a static herd of N'dama cattle at Teaching and Research Farm (T. R. F.) of the University of Ibadan is discussed.

It is hoped that the available information here will be of interest to clinicians on the field.

MATERIALS AND METHODS

This investigation was conducted between June and December 1978.

296 faecal samples were collected manually from the rectum of 50 head of adult N'dama Cattle grazing on the Teaching and Research Farm (T. R. F.) of University of Ibadan.

Samples were taken to the Laboratory immediately and examined. Oocysts were recovered from the faeces employing modified McMaster technique (9). Oocysts floating free of distortion on the under surface of the cover-

slip in a medium of saline were examined under Microscope ($\times 10$ objective $\times 10$ ocular) and measured on the scale of ocular micrometer and the resulting readings transposed into microns (3).

A total of 1 215 oocysts were measured. The criteria for identification of the oocysts were based on the previous studies of CHRISTENSEN (3) in his Alabama Survey in their Vom survey.

RESULTS

A total of 296 faecal samples were collected from 50 heads of adult N'dama cattle in the Farm (TRF). 185 (63 p. 100) of the 296 faecal samples contained oocysts. The nine species and percentage of occurrence of *Eimeria* encountered are recorded in table I. The morphological

TABLE I
Species and percentage occurrence of *Eimeria* occurring in a static herd of bovines in Ibadan

Species of <i>Eimeria</i>	Percentage of occurrence
1. <i>Eimeria bovis</i>	30
2. <i>E. auburnensis</i>	15
3. <i>E. bukidonensis</i>	14
4. <i>E. ellipsoidalis</i>	13
5. <i>E. alabamensis</i>	10
6. <i>E. zurni</i>	6
7. <i>E. canadianensis</i>	4
8. <i>E. cylindrica</i>	3
9. <i>E. subspherica</i>	3

descriptions of the species of *Eimeria* encountered was illustrated in table II.

T a b l e N° II

<i>Eimeria</i> species	Sizes of unsporulated oocysts (u)			Morphology of unsporulated oocysts
	Range sizes, (u) (Length x Breadth)	Average Length. Size (u)	Average Breadth Size (u)	
1. <i>Eimeria bovis</i>	19.2-33.6 x 13.8-25.2	24.6 + 0.30	19.8 \pm 0.24	Ovoidal in shape, blunted at the narrow end. Microcycle present. Transparent wall ; but thinner near the micropylar end. Oocysts brownish in colour.
2. <i>Eimeria auburnensis</i>	22.8-37.8 x 16.2-27.6	28.2 + 0.30	22.2 \pm 0.30	Elongated ovoid ; Micropyle appears faintly. Oocysts colourless to brownish in colour. Smooth homogeneous, transparent oocyst wall.
3. <i>Eimeria bukidonensis</i>	18.0-36.0 x 14.4-28.8	27.2 + 0.30	21.8 \pm 0.30	Pyriform in shape, rough and speckled oocyst wall. Micropyle conspicuously present. Oocyst dark-brown in colour.
4. <i>Eimeria ellipsoidalis</i>				Ellipsoidal in shape mostly; vary from subspherical to subcylindrical. Micropyle imperceptible. Oocysts colourless.
5. <i>Eimeria alabamensis</i>	17.4-33.6 x 13.8-29.4	27.6 + 0.36	20.4 \pm 0.30	Typically pyriform; No perceptible micropyle. Oocysts colourless.
6. <i>Eimeria zurni</i>	15.6-27.0 x 12.6-21.6	19.2 + 0.24	16.8 \pm 0.24	Some of the oocysts are subspherica to ellipsoidal. No perceptible micropyle visible. Oocyst wall is thin, transparent and of uniform. Oocysts colourless.
7. <i>Eimeria canadianensis</i>	19.8-41.1 x 16.2-28.8	25.8 + 0.30	20.4 \pm 0.54	Cylindrica to ellipsoidal in shape. Some are tapered at the end. Micropyle conspicuously present. Oocysts are yellowish-brown.
8. <i>Eimeria cylindrica</i>	88.0-28.2 x 11.4-24.6	22.2 + 0.30	18.0 \pm 0.24	Typically cylindrica, characterised by parallel sides in the middle third. Micropyle absent. Thin wall. Oocysts colourless.
9. <i>Eimeria subspherica</i>	13.8-27.0 x 11.4-24.6	17.4 + 0.36	15.6 \pm 0.36	Typically subspherica. No perceptible micropyle. Oocysts colourless.

E. bovis is the most predominant species and most frequently encountered. *E. bukidnonensis*; *E. auburnensis*; *E. alabamensis* and *E. zurnii* were common species in most cases.

In almost all the positive samples examined, multiple infections were most common with intercurrent helminth parasites.

DISCUSSION

This survey revealed a total of nine (9) oocysts types all of which constitute recognized species. Most of these species had previously been recognized and identified (1, 3, 6, 7, 8, 10).

Eimeria bovis is the most predominant species and most frequently encountered. It is commonly associated with clinical disease either alone or in combination with *E. zurnii*.

The nine *Eimeria* species recorded in table I have already been recognized and described in Nigeria with the exception of *Eimeria brazilensis* and *Eimeria wyomingensis* which were however reported by LEE and ARMOUR.

Eimeria brazilensis has been recognized and described as new species by TORRES and RAMOS (12) in Brasil. Most of the clinical cases of intestinal coccidiosis observed in bovines in Nigeria are predominantly associated with *Eimeria bovis* and *Eimeria zurnii*.

Majority of the N'dama cattle appears cli-

nically healthy. This may be as a result of the immunity due to constant exposure to the prevailing oocysts. Some of these animals serve as carriers to the younger animals thus shedding oocysts thereby contaminating the whole grazing area.

In this survey, some difficulties in the differentiation and classification of the oocysts into species were encountered. Identification of the oocysts was based on morphological features, sporulation times and sizes of oocysts. This has been found useful and with experience the difficulties will soon disappear. The results of this investigation affords us the opportunity of recognizing the *Eimeria* species of bovine prevalent in Nigeria as a whole with a view of establishing a fairly accurate identification and classification of coccidia infection in bovine both under field and Laboratory conditions.

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SUMMARY

Two hundred and ninety six (296) faecal samples were examined out of which 185 (63 p. 100) samples were positive for oocysts.

Nine species of *Eimeria* were recognized and described. Most of the positive infections were multiple consisting of two more than three species. Seven faecal samples revealed pure infections of single species. *Eimeria bovis* was predominant and most frequently encountered.

RESUMEN

Estudios sobre las especies de coccidios del ganado en Nigeria :

I. — Observación preliminar sobre la existencia de especies de *Eimeria* en un rebaño de bovinos N'Dama

El examen coproscópico de 296 bovinos mostró que se encontraba oocistos en 185 de ellos (es decir 63 p. 100). Se identificaron y se describieron 9 especies: *Eimeria bovis*, *E. auburnensis*, *E. bukidnonensis*, *E. ellipsoidalis*, *E. alabamensis*, *E. zurnii*, *E. canadensis*, *E. cylindrica*, *E. subspherica*. En la mayor parte de los casos, se trataron de infecciones mixtas causadas por dos o hasta tres de dichas especies, siete animales no siendo parasitados más que por una especie: *Eimeria bovis* que fué la especie predominante y la mayoría de las veces encontrada (30 p. 100 de los casos positivos).

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