Seasonal occurrence of coccidia in a mixed herd of sheep and goats at Nebo, Northern Province, South Africa

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ABSTRACT

The seasonal occurrence of coccidial oocysts was determined in a mixed herd of indigenous goats and cross-bred sheep at Nebo, Northern Province, South Africa. The herd of *c.* 30 sheep was housed with *c.* 70 goats in 1 camp. Over a period of 14 months, 114 faecal specimens were collected from sheep and 369 from goats and the number of oocysts per gram of faeces (OPG) determined. The mean OPG value for the adult sheep (1187.9) was significantly ($p = 0.035$) lower than the mean OPG value for the adult goats (7042.9). The highest mean value was recorded in the adult sheep during March 1996 (3044.4) and in adult goats during June 1995 (51568.7).

Key words: coccidia, *Eimeria* spp., goats, seasonal occurrence, sheep.

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INTRODUCTION

Coccidiosis in small stock is caused by *Eimeria* spp. Although the cumulative effect of helminthosis and coccidiosis, as well as other factors, must be taken into account, coccidiosis remains a very important cause of enteric disease and mortality in young animals[1].

Eimeria spp. have been isolated from sheep and goats on all continents. Prevalence studies have shown that *Eimeria* oocysts are widely present in the faeces of both normal and diseased individuals, *e.g.* 91 % of goats and 93 % of sheep were infected in Tanzania[3].

A close morphological similarity exists between the oocysts of the *Eimeria* spp. of sheep and goats[6]. However, certain well-controlled experiments have shown negative results when cross-transmission of *Eimeria* spp. has been attempted between these species[5].

There is a general paucity of information on the occurrence of *Eimeria* spp. in small stock in South Africa. The object of this study was to determine the seasonal occurrence of coccidial oocysts in a mixed herd of indigenous goats and cross-bred sheep at Nebo, a rural area in the Northern Province of South Africa (24.24 S, 29.46 E).

MATERIALS AND METHODS

The herd at Nebo consisted of *c.* 70 indigenous goats and *c.* 30 sheep of mixed origin. The animals were housed together in a camp (25 × 25 m) which was partially roofed and had a dirt floor. The herd belonged to the traditional chief in the area and was kept on the property of the Lebowa Agricultural Corporation. No breeding season was followed and lambs and kids were born sporadically throughout the year. All the animals were let out to graze at *c.* 12:00 and returned at *c.* 16:00. They grazed on the pasture surrounding the camp and were looked after by a herdsman.

Faecal samples were collected monthly from May 1995 to June 1996. An average of 20 adult goats and 9 kids were sampled monthly as well as *c.* 8 adult sheep. Lambs were not always sampled as they were often absent from the herd. Faeces were collected freshly voided or directly from the rectum of the animal. Random sampling was carried out since there was no means of identifying individual animals. The movement of animals in and out of the herd could also not be controlled.

The modified McMaster technique[7] was used to calculate the number of oocysts per gram of faeces (OPG). Statistical analysis of the results was performed using the following packages: SAS (Statistical Analysis System) and BMDP (Biomedical Computer Programs).

RESULTS

Over the period of 14 months, 114 samples were collected from sheep and 369 from goats. The mean OPG in the adult sheep was 1187.9 and 7042.7 in the adult goats (Table 1); the difference was significant ($p = 0.035$). The adult sheep generally had very low counts, the highest being 11 100 OPG. The maximum OPG count in a goat was 468 457. Owing to the low number of specimens from lambs, the mean OPG values of lambs and kids were not compared statistically.

The numbers of specimens falling within specific OPG ranges are given in Table 1. The highest percentage of adult sheep specimens had OPG counts of 50–999, while the lambs had slightly higher counts, falling within the 1000–4999 OPG range. The highest number of both mature goats and kids fell within the 1000–4999 OPG range.

Mean monthly OPG values of the adult sheep were consistently lower than those of adult goats (Fig. 1). The lowest mean value for the adult sheep was recorded in June 1996 (122.2) and the highest in March 1996 (3044.4). Oocyst numbers were high in May and June 1995. They remained low until February 1996, showing only a slight increase in November (1143.3) and December 1995 (1087.5).

OPG counts for mature goats were high from May to September 1995, decreasing in October 1995 and rising again from November 1995 to March 1996 (Fig. 1). The mean OPG value for adult goats was 51568.7 in June 1995, due to 3 specimens with OPG values >100 000 (one of these being 468 467).

DISCUSSION

In this study the adult sheep excreted significantly fewer oocysts than the adult goats. This agrees with a study in Tanzania, where the mean oocyst count for goats (3200 OPG) was higher than for sheep (2900 OPG)[3]. In a study in the Nyandarua district of Kenya, most specimens from Corriedale and

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Table 1: **The number of faecal specimens, collected from adult and immature sheep and goats at Nebo, Northern Province, South Africa, falling within specific oocysts per gram of faeces** (OPG) **ranges** (percentages in brackets; maximums underlined).

	Adult sheep (*n* = 102)	**Lambs** (*n* = 12)	**Adult goats** (*n* = 274)	**Kids** (*n* = 95)
OPG range[a]				
0[b]	2(2)	1(8.3)	–	1(1.1)
1–49	2(2)	–	–	–
50–999	60(58.8)	3(25)	49(17.9)	7(7.4)
1000–4999	35(34.3)	5(41.7)	152(55.5)	40(42.1)
5000–9999	2(2)	–	44(16.1)	14(14.7)
10 000–49 999	1(1)	1(8.3)	26(9.5)	28(29.5)
50 000–99 999	–	2(16.7)	–	4(4.2)
100 000+	–	–	3(1.1)	1(1.1)
Mean OPG	1187.9	17244.4	7042.9	13014.7
SD[c]	1549.6	33752	32776.6	19675.3

[a]Number of specimens with OPG values within the range given in column 1.
[b]Number of specimens negative for oocysts.
[c]Standard deviation.

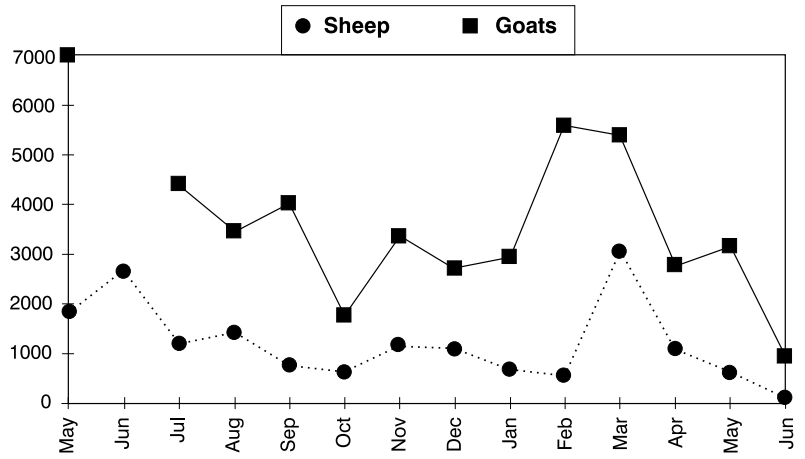

Fig. 1: **The mean monthly oocysts per gram of faeces values for adult sheep and goats at Nebo, Northern Province, South Africa, May 1995 – June 1996**. The June 1995 value for adult goats is not included, as it was very high (51568.7).

Corriedale × Merino sheep had low oocyst counts and no cases of clinical coccidiosis were encountered[4].

The high oocyst counts in the mature sheep in March 1996 followed a period of heavy rain in the area in January and February. The mean oocyst counts for the goats increased simultaneously during February and March 1996 (5576.6 and 5371.2, respectively).

Twelve species of *Eimeria* have been recorded in sheep[2] and 16 species in goats[8]. No species identification was done in this study, as the number of animals sampled was low, especially the number of lambs. Furthermore, the number of oocysts per gram of faeces was low, the mean monthly OPG values for the adult sheep only exceeding 2000 OPG in June 1995 (2642.8) and in March 1996 (3044.4) (Fig. 1). Also, no clinical signs of coccidiosis were evident. *Eimeria* spp. identification is not routinely carried out in clinical practice and, therefore, not reported in this study for either the sheep or the goats.

Mutton is an important and valuable source of protein in South Africa. This study concerned one aspect of rural sheep production, but the scope for further investigation into these animals is wide and should receive more attention.

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