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Study on Coccidia Infection and Species in Cyprus Shami Goat Population

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Abstract

A survey was undertaken to determine the prevalence of coccidian and helminth infections in the Cyprus Syami goats in two goat farms in the states of Pahang and Negeri Sembilan. The burden of coccidiaoocysts and helminth eggs were determined by the McMaster technique. Identification of *Eimeria* species was carried out following oocyst sporulation in 2.5% Potassium dichromate solution. The burden of helminthes and coccidia in terms of egg and oocyst counts per gram of faeces was high especially in young animals under the extensive management system. Eimeriaoocysts were found in all faecal samples examined. The species of coccidia identified were *E. ninaekohlyakimovae, E. arloingi, E. christenseni, E. hirci, E. alijevi, E. jolchijevi, E. caprina, E. caprovina and E. pallida*. The most prevalent species identified was *E.arloingi*, found in 71% of the samples followed by *E. Ninakohlyakimovae* (67%), *E. christenseni* (63%) and *E. alijevi* (61%). Other species present were *E. hirci, E. jolchijevi, E. caprovina, E. caprina* and *E. pallida* in 34, 22, 12, 9 and 4% of the faecal samples examined respectively. Oocyst counts were significantly higher in animals below 8 months and in animals kept under extensive management system ($P<0.05$). High oocyst counts were mainly of non-pathogenic species. High coccidial infection was found to be directly related to poor hygienic conditions in the management system. Morbidity rates in kids could not be related to the intensity of coccidial infections

Keywords: McMaster technique, Eimeriaspp; Goat; Cyprus Shami

Introduction

Coccidiosis is a parasitic disease of the intestinal tract caused by microscopic organisms called coccidia, causing economic losses in livestock productions especially goats kept in large numbers under various management systems.

Seventeen species of Eimeria are known to infect goats throughout the world of which nine species *E. arloingi, E. christenseni, E. ninacohylakimovae, E. alijevi, E. jolchijevi, E.hirci, E. aspheronica* have been recorded in Malaysia. The Cyprus Shami goat which is native to the Middle East countries is a hardy breed and highly adaptive to new environments. The doe is noted for its high milk production and its ability to produce triplets or even quadruplets. High milk production, averaging 4 – 5 litres, is attained 3 – 4 days following parturition and with the current program to improve the goat sub-sector it is envisaged that this breed could replace some of common goat breeds in Malaysia such as the Boer and Jamnapari for meat or milk production.

The objective of this study was to evaluate the prevalence of coccidian and helminth infections in two newly established Shami goat farms in the states of Pahang and Negeri Sembilan. The study takes into consideration the management practices adopted by the farms as it is a well known generality that parasitic infection is closely related to management practices.

Materials and Methods

A Shami goat farm in Pahang state which adopts the extensive management system and a similar farm in Negeri Sembilan which practices the intensive management system were selected for this study. In both farm the goats were divided into two age groups. Group 1 was animals below one year old while group 2 were adult goats more than two years old. Faecal samples from 81 animals were collected for coccidian oocysts and helminth eggs count using modified McMaster technique. Samples positive for coccidian oocysts were subsequently incubated in 2% Potassium dichromate for species identification based on their morphological features described by Anonymous, (1986).

Results

The prevalence for coccidia in relation to management practices and animal age groups are shown in Figures 1 and 2. Shami goat farm practicing the intensive management system showed that 85% of animals in the farm had low oocyst count while the remaining 15% had high to very high oocyst count. The farm which practices the extensive management system had high oocysts count with 19.5% of the goats having very high (>4500) counts, 43.9% animals had high (3001-4500) counts, 19.5% had moderate (1501-3000) counts, and 17.1% had low (0-1500) counts. *Eimeria arloingi* was the most common species identified with an overall prevalence of (71%), followed by *E. ninakohlyakimovae* (67%) and *E. christenseni* (63%). Other species identified were *E. alijevi* (61%), *E. hirci* (34%), *E. jolchijevi* (22%), *E. caprovina* (12%), *E. caprina* (9%), and *E. pallida* (4%).

Discussion

The prevalence of coccidia infections was highest in young Shami goats based on the high oocyst counts. The higher infestations in kids of 6–7 months could be explained by the lack of passive immunity provided by the colostrum during the first few weeks following birth (Taylor, 2007). However high infestation could be attributed to the management practices of keeping young kids alongside their does in and near the goat sheds thus exposing them to infection. Goats more than one year old showed a lower oocyst counts indicating the possibility of the development of acquired immunity. The role of coccidiosis in mortality cases in the present study is difficult to assess. Yvore´ *et al*, (1980) claimed that severe enteric lesions and very high oocyst count were associated with diarrhoea. In the present study, diarrhoea was not a common clinical sign among kids and high oocyst counts were rarely associated with diarrhoa.

E. ninakohlyakimovae is considered to be the most pathogenic *Eimeria* spp. (Pellerdy, 1974) Yvore *et al*. 1980) as counts of 200,000 *E. ninakohlyakimovae* oocysts per gram faeces are associated with severe diarrhoea, depression and death. In the case of *E. arloingi* counts up to 24-106 OPG were only associated with mild, transient diarrhoea. Although *E. ninakohlyakimovae* in the present study was widespread, differential oocyst counts showed that the intensity of infections caused by this species was low in most cases. Thus, high oocyst counts were mainly attributed to species of lower pathogenicity and not by *E. ninakohlyakimovae*.

One of the most common factors that precipitated in coccidiosis is heavily contaminated environment (Schillhorn van Veen, 1986.). According to Catchpole *et al*. (1993), clinical coccidiosis is mainly seen in intensive management system; in less intensive systems disease rarely occurs because the young animals are exposed to the parasites rather gradually and are able to gain effective immunity as the animal ages. A typical elevated, slatted floor Malaysian goat shed reduces the threat of parasitic infection through efficient waste evacuation approach. In this study the intensive management system goats had a lower oocyst counts compared to the extensive system. Other factors such as nutrition could contribute to the animals' health status.

Table 1. Eimeria spp identified in Cyprus shami goats

EimeriaSp	Number of Animal (Total = 81)	Percentage of Animals affected
E. christenseni	51	63
E. ninakholyakimovae	54	67
E. pallida	3	4
E.caprina	7	9
E.hirci	27	34
E. alijevi	49	61
E. caprovina	9	12
E. jolchijevi	17	22
E. arloingi	57	71

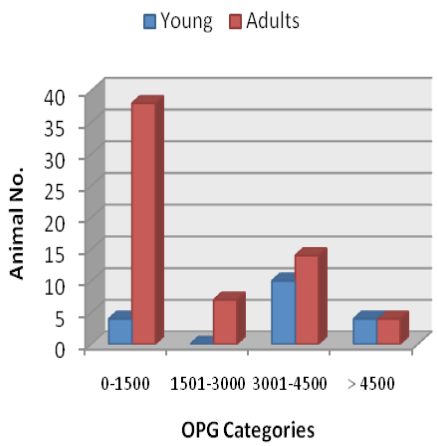

Figure 1. Oocyst burden based on age differences

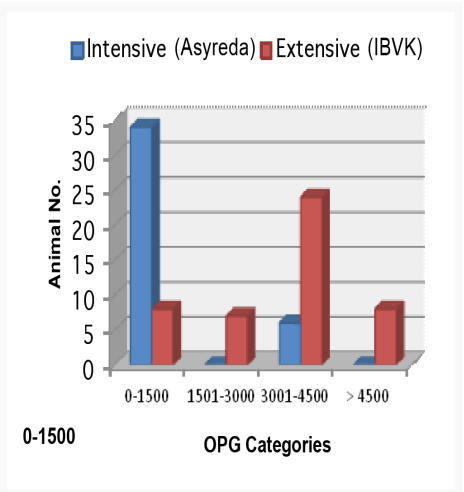

Figure 2. Oocyst burden based on management differences

Conclusion

It is concluded from the present study that there is a prevalence of coccidian infection among kids in the newly established Shami goat farm. The high prevalence appears to be attributed to the management system, in this case the extensive management system. Among the nine *Eimeria sp*. identified *E. arloingi* was the most common. The high oocyte count among the kids is from species of low pathogenicity. The present study also showed that the raised slatted floor goat sheds appear to contribute towards reducing the prevalence of coccidia in these farms.

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