PERSISTENT EFFECT OF IVERMECTIN AGAINST *HAEMONCHUS CONTORTUS* IN GOATS

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SUMMARY: The efficacy of ivermectin was tested against naturally occurring gastrointestinal nematodes in goats on the basis of pre- and post-treatment faecal egg counts and larval cultures. The period of persistent activity of the compound was observed to be at least 14 days after treatment.

Key words: Ivermectin, *Haemonchus contortus*, goat

INTRODUCTION

Mortality in goats is a serious economic constraint to goat production in Malaysia. Various diseases in association with inadequate control and prevention represent major constraints to productivity in goats. Gastrointestinal parasitism and respiratory diseases are particularly rampant.

Ivermectin, as a chemical control for parasitic disease, has been recently introduced into the local market. A striking advantage of ivermectin is the residual or persistent effect of the drug against the immature stages of certain nematodes for a certain period of time after administration (Bremner *et al.*, 1983). The drug has not been fully evaluated in Malaysia although its usage has been recommended. Reports on the use of ivermectin in small ruminants have been mainly with nematodes affecting sheep (Campbell, 1985). The assumption that dose rates for anthelmintics in sheep would be equally efficacious in goats is shown to be inaccurate by Hall *et al.* (1981). It may, therefore, be necessary to evaluate anthelmintic dose rates for sheep and goats independently (Hall *et al.*, 1981).

The results of the following study confirms the efficacy of ivermectin in goats and its persistent effect against *Haemonchus contortus.*

MATERIALS AND METHODS

Eighteen goats raised on pasture (known to have third-stage larvae) during the day and housed at night were used in the study. Hence, these goats were naturally infected with nematodes. Ivermectin ('Ivomec'; Merck, Sharpe & Dohme) was in a formulation containing 10 mg/ml of the drug. Ten goats were given a single subcutaneous injection of ivermectin at a dose rate of 200 ug/kg. The remaining eight goats acted as untreated controls. Faecal samples was taken per rectum two days prior to treatment and for several days after treatment for up to 33 days. The nematode burden was assessed by egg counts using the McMaster technique performed on the same day as faecal collection. Faecal samples having strongyle-type eggs were cultured to obtain and identify third-stage nematode larvae. The nematode burden would have been much better assesed by post-mortem worm counts but this was not possible in this study.

RESULTS

In Fig. 1, the mean nematode egg counts of treated and control goats are shown. Before treatment, all goats had eggs of *Haemonchus contortus*. The egg counts of treated goats were reduced to zero 24 hours after treatment. This egg count remained zero until day 29 post-treatment when only one goat had *Haemonchus contortus* eggs in its faeces. The other goats did not show evidence of worm burden up to 33 days post-treatment. The Student's t-test used to evaluate mean egg burdens between treated and untreated goats showed significant differnces ($P < .05$) for all the tested days (Table 1).

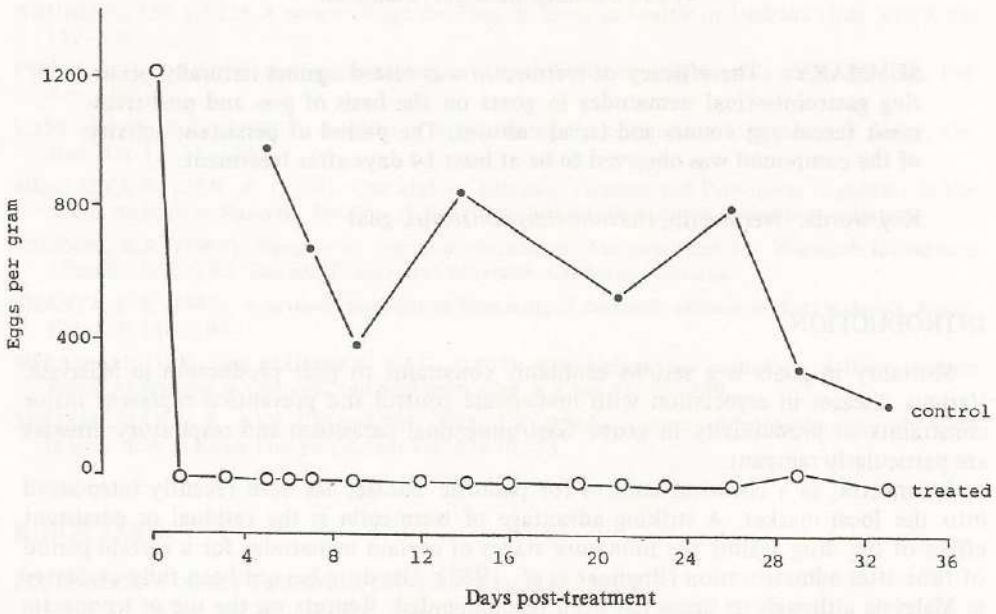

FIG. 1: Mean faecal nematode egg counts of goats treated with ivermectin compared with control animals.

DISCUSSION

Ivermectin was found to be totally effective against *Haemonchus contortus* in the treated goats. It gave protection to the goats for at least up to the end of the study period i.e. 33 days, except for one goat which had faeces positive for eggs of *Haemonchus contortus* on day 29 post-treatment. It may be that infective larvae was ingested two weeks post-treatment in this particular goat since the prepatent period of *Haemonchus contortus* is about 15 days. The period of persistent effect is obtained by subtracting the length of time that a goat first has eggs in its faeces after treatment from the prepatent period. Therefore the persistent effect of ivermectin in the one infected goat was 14 days. However, post-treatment release of hypobiotic larvae from the abomasal mucosa may also play a role. Without necropsy, it is impossible to confirm this possibility. An investigation into the seasonal changes in the population structure of *Haemonchus* in tracer goats showed that although hypobiotic larvae were evident during each month of the year under study, very low level inhibition was shown (Ikeme *et al.*, 1987).

Samples from the other nine treated goats taken at day 33 post-treatment showed no egg produced. Therefore, this indicates that the period of persistent effect of ivermectin

TABLE 1
Mean faecal nematode egg counts ± S.D. of treated and untreated goats after ivermectin

Days post treatment	Mean eggs per gram	
	Treated	Untreated
5	0	1014 ± 815**
7	0	701 ± 669**
9	0	369 ± 196**
14	0	873 ± 272**
20	0	562 ± 462**
26	0	840 ± 446**
29	227*	354 ± 214**
33	0	290 ± 128**

* Detected in one animal only.
** $p < 0.05$.

for these goats was 18 days. Barth (1983) also found that the persistent effect of ivermectin was present for at least 14 days after parenteral administration of the drug.

The present study confirms that ivermectin has a substantial effect on the reduction of egg burden, most probably the result of elimination of the adult worms and the anthelmintic effect persisted for 14 to 18 days.

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RINGKASAN

EFEK LANJUTAN IVERMECTIN TERHADAP JANGKITAN HAEMONCHUS CONTORTUS *PADA KAMBING.*

Kesan ivermektin telah diuji keatas jangkitan nematod gastrousus yang berlaku pada kambing. Ujian ini dilakukan berasaskan pengiraan telor dalam tinja sebelum dan selepas rawatan. Jangkamasa aktiviti berterusan bahan tersebut terdapat sekurang-kurangnya selama 14 hari selepas rawatan.