OXFENDAZOLE1—ANTHELMINTIC ACTIVITY IN EGYPTIAN GOATS ARTIFICIALLY INFECTED WITH GASTROINTESTINAL NEMATODES

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SUMMARY

The recently developed benzimidazole anthelmintic, oxfendazole, was tested against artificial nematode infestations in Egyptian goats using oral dosing at 4.5 and 2.8 mg/kg. A 100% clearance of mature and immature Haemonchus contortus, Trichostrongylus axei, Ostertagia circumcincta, Cooperia curticei, Bunostomum trigonocephalum and Chabertia ovina was obtained at the 4.5 mg/kg level. Very high levels of clearance against the mature worms were obtained at 2.8 mg/kg but the drug was less effective against immature worms at the lower dose rate. PCV, haemoglobin concentration and total erythrocyte counts declined after infection but became significantly (P < 0.001) raised in treated animals.

INTRODUCTION

Oxfendazole (methyl[5-(phenylsulfinyl)-1-H-benzimidazole-2-yl]carbamate) is a new broad-spectrum member of the benzimidazole class of anthelmintics. It has been shown to possess very high activity against the common gastrointestinal roundworms, lungworms and tapeworms (Moniezia spp.) in sheep and cattle (Averkin, Beard, Dvorak, Edwards, Fried, Kilian, Schiltz, Kistner, Drudge, Lyons, Sharp and Corwin, 1975; Leimbacher, Nicholas and Delahaye, 1976; Baker and Fisk, 1977; Chalmers, 1977, 1978; Downey, 1976, 1977), but there has been no work published concerning the use of oxfendazole in goats.

In sheep, field trials have shown that at the dose rate of 5 mg/kg, oxfendazole will virtually remove all roundworms and tapeworms from sheep of all ages and under varying climatic and husbandry conditions (Leimbacher et al., 1976; Baker and Fisk, 1977; Downey, 1977). Chalmers (1978) reported that at 2.5 mg/kg a high level of efficacy was demonstrated in cattle against natural infections of nematodes in cattle grazed under farm conditions in New Zealand.

This paper presents the results of a trial undertaken in Egypt to evaluate the efficacy of oxfendazole at 2 different dose levels in treating the mature and immature stages of economically important nematodes in artificially infested indigenous goats.

MATERIALS AND METHODS

Twenty-eight indigenous Egyptian desert goats, all female, aged between 12 and 18 months were purchased and introduced to the Animal Health Research Institute at Dokki, Cairo. Average body condition was poor with liveweights varying from 7 to 23 kg. The goats were tagged and each animal was orally dosed with levamisole at 10 mg/kg before being placed in a clean paddock where they were fed on a dry ration of hay and green lucerne with ad libitum water.

After a 7 day adaptation period, faecal samples were obtained from each animal and examined to confirm that the goats were free of nematode infestation. Blood samples were also taken for haematological examination. All goats were then infested per os with 2,200 infective nematode larvae as follows:

1 SYSTAMEX 2.265% w/v: the Wellcome Foundation, Berkhamsted, Hertfordshire, UK.
The distribution was designed to reflect a nematode infestation typical of small ruminants in Egypt. Blood samples were again taken one week after infestation.

Two weeks after infestation 15 goats were randomly allocated on the basis of liveweight to 3 experimental groups.

Group A (5 animals): Oxfendazole as the commercially available 2:265% w/v suspension was administered orally at a dose rate of 1 ml/5 kg liveweight (4:5 mg/kg active ingredient)

Group B (5 animals) Was similarly drenched but at a dose rate of 1 ml/8 kg liveweight (2:8 mg/kg active ingredient)

Group C (5 animals): Untreated controls.

Further blood samples were taken from the goats as detailed in Table III. The animals in Groups A, B and C were slaughtered 3 weeks after infestation. Abomasal and intestinal ingesta were collected and examined by the method described by Herlich (1956). The following morning a binocular dissecting microscope was used to determine numbers of nematodes present in the material recovered from each of the goats. Twenty-one days after infestation, the number of eggs per gram of faeces (epg) was determined for each of the remaining 13 goats using a modified McMaster technique (Wetzel, 1951).

These goats were then randomly allocated by liveweight into 3 further experimental groups as follows:

Group D (3 animals) Dosed with oxfendazole at 1 ml/5 kg liveweight (4:5 mg/kg active ingredient)

Group E (5 animals): Dosed with oxfendazole at 1 ml/8 kg liveweight (2:8 mg/kg active ingredient)

Group F (5 animals): Untreated controls.

One week later, blood and faecal samples were taken from each of the animals and faecal egg counts were determined. The goats were then slaughtered, the abomasum and small and large intestines of each animal examined and the numbers of the recovered adult worms recorded as shown by Walley (1966).

RESULTS

Faecal examination 7 days after levamisole administration revealed that the animals were free of adult nematode infestation but that some were excreting small numbers of coccidial oocysts.

The burdens of immature gastrointestinal nematodes in the treated and control goats of Groups A, B and C are given in Table I. The burdens of mature gastrointestinal nematodes in terms of faecal egg counts and adult worms recovered from treated and control goats of Groups D, E and F are given in Table II.

Table I shows that oxfendazole at 4:5 mg/kg was 100% effective against immature *Haemonchus contortus, Trichostrongylus axei, Ostertagia circumcincta, Chabertia ovina,*