UNIVERSITI PUTRA MALAYSIA

INFLUENCE OF HUSBANDRY PRACTICES ON ENDOPARASITISM AND EVALUATION OF ANTHELMINTIC RESISTANCE ON SMALL RUMINANT FARMS IN SELANGOR AND NEGERI SEMBILAN

CHAI AITING

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INFLUENCE OF HUSBANDRY PRACTICES ON ENDOPARASITISM AND EVALUATION OF ANTHELMINTIC RESISTANCE ON SMALL RUMINANT FARMS IN SELANGOR AND NEGERI SEMBILAN

CHAI AITING

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It is hereby certified that we have read this project paper entitled "Influence of Husbandry Practices on Endoparasitism and Evaluation of Anthelmintic Resistance on Small Ruminant Farms in Selangor and Negeri Sembilan", by Chai Aiting and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999 – Final Year Project.

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DEDICATION

To,

My dearest family,

Friends,

and all who work in the industry.

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Lastly, I would also like to acknowledge those who have not been mentioned here for their involvement either directly or indirectly in the completion of this study.

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Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek Ilmiah Tahun Akhir.

PENGARUH AMALAN PENTERNAKAN PADA ENDOPARASITISME DAN PENILAIAN KETAHANAN ANTELMINTIK DI LADANG RUMINAN KECIL DALAM SELANGOR DAN NEGERI SEMBILAN

oleh

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2015

Penyelia : Prof. Dr. Rehana Abdullah Sani

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Kajian ini dijalankan untuk mengkaji pengaruh amalan penternakan yang dipilih pada endoparasitisme dalam ruminan kecil seperti yang ditunjukkan oleh kiraan telur cacing. Pemeriksaan najis di enam ladang ruminan kecil telah dijalankan di Ladang-Ladang Angkat, Fakulti Perubatan Veterinar, UPM. Sampel najis dikumpulkan daripada 40 ekor ruminan kecil dari setiap lading diperiksa menggunakan teknik McMaster yang diubah

suai untuk penentuan kiraan telur cacing (FEC) . Soal selidik telah ditanya kepada enam pemilik untuk mendapatkan maklumat mengenai amalan penternakan yang dipilih dan diterima pakai di ladang mereka. FEC adalah lebih tinggi di ladang yang membenarkan haiwan untuk meragut berbanding dengan ladang-ladang yang tidak meragut. Ladang yang menggunakan baja tahi kambing sendiri sebagai baja pastura mempunyai FEC yang lebih tinggi berbanding dengan ladang-ladang yang menjual baja haiwan itu. Ladang-ladang yang menggunakan rumput baik sebagai makanan mempunyai kambing dengan kondisi badan yang lebih baik daripada ladang yang membenarkan haiwan mereka untuk meragut rumput sedia ada. Walau bagaimana, pemakanan yang lebih baik yang dicapai dengan rumput yang lebih baik sia-sia dengan penyakit semasa dan sumber air yang kotor. Ujian Pengurangan Telur Cacing (F.E.C.R.T) telah dijalankan di sebuah ladang (Ladang A) yang mempunyai haiwan yang tinggi min FEC. The antelmintik yang digunakan dalam ujian ini ialah albendazole, ivermectin, closantel dan levamisole. Keputusan peratus pengurangan FEC menunjukkan bahawa populasi cacing dalam Ladang A menunjukkan ketahanan terhadap albendazole, ivermectin dan closantel. Walau bagaimana, ketahanan terhadap levamisole hanya disyaki. Pembezaan larva infektif berasal dari kultur najis menunjukkan bahawa spesies strongyle yang jelas di ladang-ladang ini adalah *Haemonchus contortus.*

Kata-kata: amalan penternakan, endoparasitisme ketahanan anthelmintic,

ABSTRACT

Abstract of a project paper submitted to the Faculty of Veterinary Medicine, Universiti Putra Malaysia in partial fulfilment of the requirement for the course VPD4999- Final Year Project.

INFLUENCE OF HUSBANDRY PRACTICES ON ENDOPARASITISM AND EVALUATION OF ANTHELMINTIC RESISTANCE ON SMALL RUMINANT FARMS IN SELANGOR AND NEGERI SEMBILAN

By

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2015

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Co-Supervisor: Dr. Sharifah Salmah Syed Hussain

The study was conducted to investigate the influence of selected husbandry practices on endoparasitism in small ruminants as reflected by strongyle faecal egg counts. The anthelmintic resistance of gastrointestinal strongyles on a farm was also determined. Faecal examination of six small ruminant farms was conducted at farms of Ladang Angkat,

Faculty of Veterinary Medicine, UPM. Faecal samples were collected from 40 small ruminants from each farm and subjected to the Modified McMaster technique for determination of faecal egg count (FEC). A standardized questionnaire was directed to the six owners to obtain information on selected husbandry practices adopted on their farms. The FEC was higher in the farm that allowed its animals to graze compared to the non-grazing farms. The farm that used its goat manure to fertilize its pasture had relatively higher FEC compared to farms that sold off its animal manure. Farms that used improved grasses as feed had goats with better body condition score than the farm that allowed its animals to graze on native grasses. However the better nutrition afforded by the improved grass was negated by concurrent diseases and dirty water source present in two farms.

The Faecal Egg Count Reduction Test (F.E.C.R.T) was conducted in a farm whose animals had high FEC to determine anthelmintic resistance. The anthelmintics used in this test were albendazole, ivermectin, closantel and levamisole. Results of percent FEC reduction indicated that the strongyle population in that particular farm showed resistance to albendazole, ivermectin and closantel. However, susceptibility of the strongyles to levamisole was evident. Identification of infective larvae derived from faecal culture indicated that the major strongyle specie on these farms was *Haemonchus contortus.*

Keywords: anthelmintic resistance, endoparasitism, husbandry practices

1.0 INTRODUCTION

Small ruminants are an important economic factor in agricultural systems throughout developing countries. The economic contribution of small ruminants to poor farm households and livelihood systems is much higher than imagined (Devendra, 2007). The production of mutton in Peninsular Malaysia increased from 658 to 898 million tons from 1990 to 2001 and the annual growth rate is increasing while the per capita consumption of mutton increased from 0.5 kg to 0.79 kg (Yahya & Sukir, 2005). This reflects there is increasing demand for locally produced mutton.

Gastrointestinal nematodes, namely the strongyle worm is one of the major causes of disease of small ruminants in Malaysia causing severe economic losses due to death and poor productivity. The hot and humid climate throughout the year is favourable for the development of free living stages of nematodes and it is likely that the infective larvae are constantly available on pasture for grazing animals. Sheep and goat farmers rely heavily on anti-parasitic drugs, or anthelmintics, to control internal parasites. Hence, frequent and indiscriminate use of anthelmintics practised by the farmers predisposes the worm population to develop anthelmintic resistance which has now been identified in many countries all over the world affecting profitability of the small ruminant industry. The parasite that causes the most problem to small ruminants is *Haemonchus contortus (H contortus)*, also known as 'barbers pole' worm, and it is generally considered the most pathogenic parasite of small ruminants (Dorny *et al.*, 1994). This indicates the need to investigate the worm drug resistance status of farms to prevent its spread and to institute

suitable control measures. Monitoring efficacy of anthelmintics should be done at least once a year (Thongsahuan *et al*., 2014).

Strongyle control starts with good management. Well-nourished animals are known to withstand the effects of worm infection much better than those given a lower plane of nutrition. Besides, according to Sani *et al.* (2004), small ruminants grazing for three to four days in an area which was empty for five to six weeks has reduced worm burden. Study done by Israf *et al*. (1996) showed that strongyle egg counts is directly proportional to the strongyle worm burden. Moreover, animals supplemented with mineral blocks can reduce worm burden compared to unsupplemented animals. These indicated different husbandry system of farms can influence worm burden of animals.

Therefore, the objectives of this study are to relate the husbandry practices of the farm to the faecal egg count and to evaluate anthelmintic resistance in a farm.

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