



UNIVERSITI PUTRA MALAYSIA

***EFFECTS OF IMPLEMENTING HERD HEALTH PROGRAMME ON
PERFORMANCE OF GOATS IN A SMALLHOLDER FARM***

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FPV 2018 14



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By

MUHAMMAD SYAFIQ BIN SHAHUDIN

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Veterinary Science**

October 2017

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Veterinary Science

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October 2017

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Most of goat farms owned by smallholders in Malaysia were not managed to the expectation due to unavailability of information in good management practice for goat. Indeed, low performance of goats with respect to the growth performance, feed utilization, disease resistance, reproductive efficiency and meat and milk production was associated to improper rearing protocol specifically on herd health programme. This study was carried out to introduce a proper herd health programme for smallholder goat farm in order to enhance the farm production. This study was conducted at a smallholder goat farm in Negeri Sembilan, where initially, screening programme was done to analyze the common herd problems in the farm in term of feeding, health and breeding management problems. Then, formulation and implementation of herd health programme was done, where 60 female Boer cross goat aged 4 month old and approximately weighing about 20 kg were selected and divided into two groups; control: animals were managed according to the current practice by the farmer which has never been practice herd health programme and experimental group: animals were managed by implementing a proper herd health programme. The herd health programme given to the experimental group included feeding, vaccination, deworming, bio security and breeding programme. Throughout the study, gradual health screening programme was performed for goats in both groups at every 3 months by collecting blood, faecal and nasal swab samples. The goats were put in respected pen until reached suitable age and weight for breeding, which was 1 year old and 30 kg body weight respectively. The study was started in January 2015 and ended a year later. After 5 months of feeding programme, the mean of final body weight in experimental group (28.8 ± 0.87 kg) has shown a significant improvement compared with control group (25.6 ± 0.81 kg). Thirteen goats in the experimental group also had successfully achieved ideal body condition score with the score of 3 (86.7%), compared to only 9 goats (60%) in control group, where the score was below 3. In term of health performance, at the end of the study, the percentage of disease occurrence was significantly ($p < 0.05$) higher in control group as

compared to experimental group, where in October 2015 (last screening program), pneumonic mannheimiosis cases observed in control group was 27 cases compared to experimental group which was 2 cases. For coccidiosis, the number was high in control group (21 cases) as compared to experimental group (1 case). Colibacillosis was also high in control group (23 cases) as compared to experimental group (2 cases). Lastly for mycoplasmosis, there were 13 cases observed in control group as compared to experimental group, 5 cases. In accordance with decreasing number of disease occurrence, the mortality rate among female breeder goats was also higher in control group (16.67%) as compared to experimental group (3.33%) throughout the year. In term of breeding performance, there was significantly ($p<0.05$) increased of pregnancy rate up to 86.7%, in experimental group, as compared to 33.3% in control group. Out of 86.7% of pregnant does in experimental group, 35% of the pregnant does showed twins whereas there was no twin reported in the control group. As for kidding rate, it had significantly ($p<0.05$) increased up to 100% in experimental group, as compared to 70% in control group. Lastly, there was also an improvement in the weaning rate in the experimental group, which the weaning rate was 100%, significantly higher as compared to control group which was 57.1%. In conclusion, this study has shown that the implementation of herd health programme in smallholder goat farm can improve the performance of the goats in term of growth, disease resistance and breeding performance. Thus, herd health programme which consist of different components such as disease prevention, feeding, bio security and breeding programme is indeed a crucial program to be practiced by smallholder goat farm.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains Veterinar

KESAN PELAKSANAAN PROGRAM KESIHATAN GEROMPOK KE ATAS PRESTASI KAMBING DI LADANG PEKEBUN KECIL

Oleh

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Kebanyakan ladang kambing yang dimiliki penternak kecil di Malaysia adalah tidak diuruskan pada jangkaan oleh kerana ketiadaan maklumat dalam praktis pengurusan kambing yang standard. Justeru, prestasi lemah kambing berkaitan dengan prestasi tumbesaran, penggunaan makanan, ketahanan penyakit, kecekapan pembiakan dan penghasilan susu adalah berkait dengan protokol pembiakan yang tidak wajar terutamanya kepada program kesihatan gerompok. Kajian ini dijalankan untuk memperkenalkan program kesihatan gerompok kepada penternak kecil kambing dengan tujuan meningkatkan pengeluaran ladang tersebut. Kajian ini dijalankan di ladang kambing penternak kecil yang terletak di Negeri Sembilan, dimana pada permulaannya, program pemeriksaan dijalankan untuk menilai permasalahan biasa yang berlaku di ladang tersebut dari segi pemakanan, kejadian penyakit dan masalah pengurusan peranakan. Seterusnya, formulasi dan pelaksanaan program kesihatan gerompok dijalankan, dimana 60 ekor betina kacukan Boer berumur 4 bulan dan mempunyai berat sekitar 20 kg dipilih dan dibahagikan kepada dua kumpulan; kumpulan kawalan: kambing diuruskan menggunakan praktis semasa oleh penternak dan kumpulan uji kaji: kambing diuruskan dengan cara pelaksanaan program kesihatan gerompok. Program kesihatan gerompok yang diberikan kepada kumpulan uji kaji termasuklah vaksinasi, menyahcacing, bio keselamatan dan program pembiakan. Sepanjang tempoh kajian, program pemeriksaan kesihatan berkala dilakukan kepada kambing di dalam kedua-dua kumpulan setiap 3 bulan sekali dengan cara pengumpulan sampel darah, najis, dan calitan rongga hidung. Kambing-kambing tersebut diletakkan di dalam kandang sehingga mereka mencecah umur dan berat yang sesuai untuk pembiakan, iaitu berumur 1 tahun dan berat 30 kg. Kajian dimulai pada Januari 2015 dan berakhir setahun kemudian. Pada akhir kajian, kejadian penyakit didapati lebih tinggi di dalam kumpulan kawalan berbanding kumpulan uji kaji secara signifikan ($p < 0.05$), dimana pada Oktober 2015 (program pemeriksaan kesihatan terakhir), penyakit manheimiosis di dalam kumpulan kawalan adalah 27 kes berbanding kumpulan uji kaji, 2 kes. Untuk penyakit

koksidiosis, jumlahnya adalah lebih tinggi di dalam kumpulan kawalan (21 kes) berbanding dengan kumpulan uji kaji (1 kes). Penyakit kolibasilosis juga adalah tinggi di dalam kumpulan kawalan (23 kes) berbanding dengan kumpulan uji kaji (2 kes). Yang terakhir untuk penyakit maikoplasmosis, terdapat 13 kes di dalam kumpulan kawalan berbanding kumpulan uji kaji, 5 kes. Mengikut jumlah kejadian penyakit, kadar kematian di dalam kalangan kambing betina di dalam kumpulan kawalan juga adalah lebih tinggi (16.67%) berbanding kumpulan uji kaji (3.33%) sepanjang tahun kajian. Untuk prestasi pembiakan, terdapat peningkatan secara signifikan ($p < 0.05$) dalam kadar kebuntingan, iaitu sebanyak 87.7% di dalam kumpulan uji kaji, berbanding 33.3% di dalam kumpulan kawalan. Daripada 86.7% betina yang bunting di dalam kumpulan uji kaji, sebanyak 35% menunjukkan kebuntingan kembar. Untuk kadar anak kambing yang lahir, terdapat kenaikan yang signifikan ($p < 0.05$) sebanyak 100% untuk kumpulan uji kaji, berbanding 70% di dalam kumpulan kawalan. Yang terakhir, peningkatan juga dapat dilihat pada kadar cerai susu untuk kumpulan uji kaji sebanyak 100%, lebih tinggi secara signifikan ($p < 0.05$) berbanding kumpulan kawalan iaitu 57.1%. Sebagai rumusan, kajian ini telah menunjukkan yang pelaksanaan program kesihatan gerompok di ladang kambing mampu untuk meningkatkan prestasi kambing dari aspek tumbesaran, ketahanan penyakit, dan prestasi pembiakan. Justeru, program kesihatan gerompok yang mengandungi pelbagai komponen seperti pencegahan penyakit, program pemakanan, bio kawalan, dan pembiakan adalah program yang penting untuk diamalkan oleh penternak kecil kambing.

ACKNOWLEDGEMENTS

Bismillahirrahmanirahim, by the Name of Allah, Most Gracious, Most Merciful, Praise and grateful to Allah for giving me strength and determination to complete my thesis writing, one of the important part to fulfil my Master study.

Firstly, my thanks and appreciation goes to Dr Hasliza Abu Hassim for persevering with me as my main supervisor throughout the time to complete this research and write the dissertation. She has been always generous, guiding me during all phases of my study. I also appreciate the efforts expanded by my supervisory committee, Dr Faez Firdaus Jesse Abdullah, Prof. Dr Mohd. Zamri Saad and Prof. Dr Abd. Wahid Haron, who have kindly given their time and expertise to improve my work. I thank them for their contribution and their good-natured support.

I wish to express my sincere gratitude to the Faculty of Veterinary Medicine, Universiti Putra Malaysia, Ministry of Higher Education (MOHE) under Knowledge Transfer program (KTP), Tok Seri Buak AgroFarm and all staff members of the Universiti Veterinary Hospital (UVH, UPM) who had sincerely helping me throughout completion of this study.

To my family, especially my Ayah (En. Shahudin b. Mohd Kassim) and my Ibu (Pn Zainun bt. Ahmad), who has been a source of encouragement and inspiration to me throughout my life, a very special thank you for trusting my dreams and supporting me even though sometimes there is doubt in myself. Because of their unconditional love and prayers, I am able to complete this study. To Razila bt. Raazali, thank you for remain patience with the struggle I had been facing.

And to all my friends, Annas, Afifi, Qayum, Didi, Azri, Fariz, Adha, Shafiq who had assisted, advised, and supported me over the years, I am forever being grateful to be your friend. Last but not least, deepest thanks go to all people who took part in making this journey real.

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Veterinary Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

CAE	Caprine Arthritis Encephalitis
FMD	Foot and Mouth Disease
ME	Metabolizable Energy
MN	Maintenance Requirement
MJ	Megajoule
HCT	Haematocrit Centrifugation Technique
SAT	Serum Agglutination Test
TBA	Treptose Blood Agar
e.p.g	Eggs Per Gram
BCS	Body Condition Score
BSE	Breeding Soundness Examination
BW	Body Weight
µl	Microlitre

CHAPTER 1

INTRODUCTION

1.1 Background of study

The increase in human population has resulted in increasing demand for food, especially for the animal products (Sarma and Yeung, 1985). In the last two decades, expanding market demand for goat products such as meat and milk has resulted in the establishment of commercial goat farms in several newly developed South-East Asian countries (Liang, 2014). In Malaysia, most of the goat farms are managed by smallholders and they have contributed to the increasing production of goat's products (e.g. meat and milk) for the local market. According to Sivasupramaniam (2008), 75% of goat breeding in Malaysia is managed by smallholders, 20% are commercial goat farms and another 5% from goat farms are integrated with tree crops. However, these smallholder farmers lack knowledge and information to practice a standard management programme for goat farms which further affects the performance and production of the farm (Young, 2010).

To cope with the problem, herd health management programme was developed as a standard rearing management and disease control programme to be practiced in farms. It is a programme developed to monitor, treat and prevent health problems and ensure the welfare of animals with the aim of being cost effective for the farm business (Sibley, 2000; 2006). The main purpose of the programme is to prevent disease and improve animal health and production by introducing long term strategies focusing on the whole herd (Hall and Wapenaar, 2012). Nowadays, the intention has shifted from treating individual animal towards management on the herd level (de Kruif and Opsomer, 2004; Noordhuizen and Metz, 2005). Hence, it is important for the farmers to implement the herd health programme in the farm.

Regardless of the fact that research activities have developed comprehensive herd health management programme especially for the goats, there is still problem in the implementation at farm level especially among the smallholders. Major concern on animal nutrition, disease control, breeding and husbandry that directly affect production and profitability has not been properly understood by the farmers and entrepreneurs (Aziz, 2007). Therefore, the veterinarian has an

important role in transferring that knowledge to the farmers. As nowadays the dairy industry has evolved vastly, the scope of veterinarian's work has also changed; in the past they were called by farmers to diagnose and treat sick animals, but now they need to actively approach the farmer with suitable advice (Derks et al., 2013).

Indeed, there is a great need to do a study in assessing the effects of implementation of herd health programme in the smallholder goat farms particularly on the performance of the goats itself, such as reduction of disease occurrences, mortality rate and the breeding performance such as pregnancy rate, number of newborns, mortality rate among young kids, kidding rate and many more. This study is important as it fills the gaps of knowledge and practice among smallholder goat farms in Malaysia and at the same time, they can be referred as a standard herd health programme which can be further used later and practiced by new smallholder goat farms.

1.2 Problem statement

Poor herd health programme in a farm may lead to poor growth performance, exposing the goats towards many infectious and non infectious diseases which will further affect breeding performance of the goats such as pregnancy rate, survivability of the foetuses and kids and thus, it will lead to low farm productivity and profit margin.

1.3 Objectives of the research

The objectives of this study are:

- 1) To analyze the common problems occurred in the farm through screening programme in term of feeding management, disease occurrence and mortality rate.
- 2) To formulate a comprehensive herd health programme based on the screening analysis and further implement the programme (feeding and health management, bio security and breeding programme).

3) To assess the effects of implementation of herd health programme on growth performances (body weight and body condition score), health performances (disease occurrence and mortality rate) in the farm.

1.4 Hypothesis

Herd health programme implementation can help in improving the general performance of goats in the farm in term of improving growth performance (body weight and body condition score), health performance (occurrence of disease among goats and mortality incidence due to disease infection) and improving the breeding performance and productivity (kidding rate, pregnancy rate and lowering mortality during weaning).

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