



UNIVERSITI PUTRA MALAYSIA

***SEROPREVALENCE OF MELIOIDOSIS AMONG CATTLE IN FOSTER
FARM PROGRAMME OF THE FACULTY OF VETERINARY MEDICINE,
UNIVERSITI PUTRA MALAYSIA***

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MUHAMAD SYAZRIN BIN ABD KADIR

A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia

In partial fulfilment of the requirement for the
DEGREE OF DOCTOR VETERINARY MEDICINE

University Putra Malaysia
Serdang, Selangor Darul Ehsan

2017

It is hereby certified that we have read this project paper entitled “Seroprevalence of Melioidosis among Cattle in Foster Farm Programme of the Faculty of Veterinary Medicine, Universiti Putra Malaysia” by Muhamad Syazrin bin Abd Kadir and in our opinion it is satisfactory in term of scope, quality, and presentation as partial fulfilment of the requirement for the course VPD 4999 – Project.

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DEDICATION

I would like to dedicate this project to:

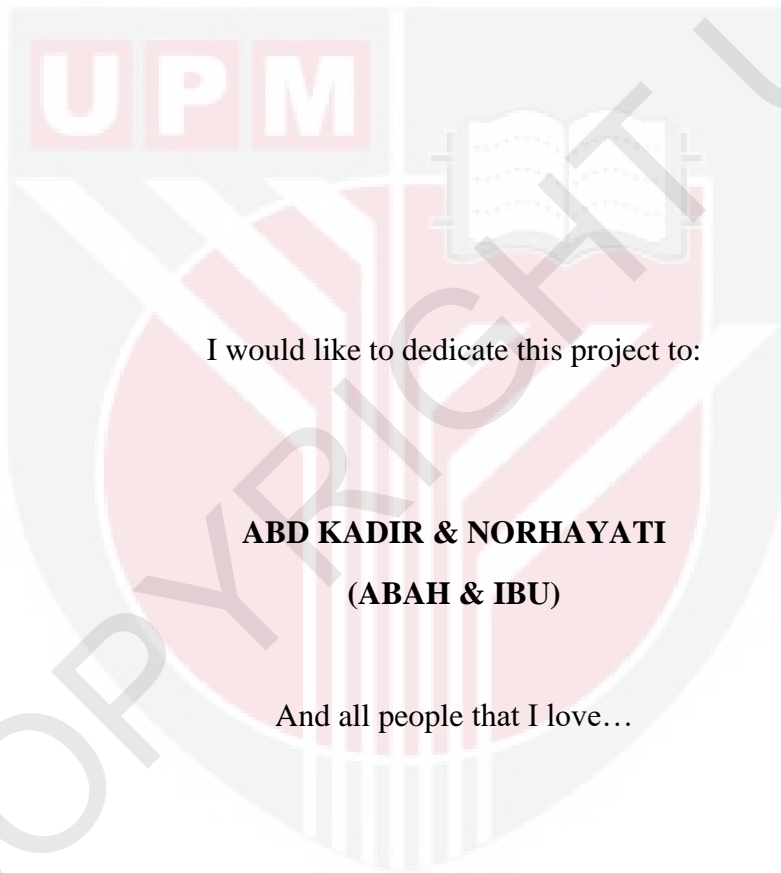
ABD KADIR & NORHAYATI
(ABAH & IBU)

And all people that I love...



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In the name of Allah, the most Merciful and the Most Compassionate

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Figure 1 Complement Fixation Test result.13



ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 - Projek.

**SEROPREVALENS MELIOIDOSIS ANTARA LEMBU DI DALAM
PROGRAM LADANG ANGKAT FPV, UPM.**

Oleh

Muhamad Syazrin Bin Abd Kadir

2017

Supervisor: Prof.Dr Abdul Rahman Omar

Co-Supervisor: Assoc Prof.Dr Jesse Faez Firdaus Abdullah

Dalam usaha untuk memajukan Malaysia sebagai hab halal haiwan ternakan, Malaysia hendaklah bebas daripada penyakit berjangkit. 'Melioidosis' adalah endemik di Asia Tenggara dan utara Australia. Penyakit ini juga memberi impak besar terhadap kesihatan haiwan serta mengurangkan produktiviti haiwan dan kehilangan protein. Kajian sebelum ini mengenai seroprevalens terhadap 'Melioidosis' kepada haiwan ternakan pada 2000-2009 telah dijalankan oleh Jabatan Perkhidmatan Veterinar Malaysia serta menunjukkan bukti daripada 100.262 haiwan

yang diuji, sejumlah 5,729 (5.7%) adalah positif untuk 'Meloidosis'. Sejak itu tidak ada kajian susulan. Kajian ini memberi tumpuan kepada seroprevalens terhadap 'Meloidosis' dalam Program Ladang Angkat FPV, UPM. Lima puluh lembu dengan campuran umur dan jantina telah dipilih secara rawak untuk pengumpulan sampel darah daripada Program Ladang Angkat FPV, UPM. Uji Fiksasi Komplemen (CFT) telah digunakan untuk mengesan antibodi terhadap Meloidosis. Hasil dari CFT menunjukkan negatif untuk semua sampel diperoleh daripada Program Ladang Angkat FPV, UPM. Kekurangan kes positif mungkin disebabkan oleh bilangan sampel yang kecil dan juga yang berkaitan dengan amalan pengurusan di mana lembu kebanyakannya disimpan di bawah sistem separa intensif di mana mereka kurang terdedah dengan tanah dan oleh itu risiko yang lebih rendah untuk dijangkiti organisma. Ini menunjukkan terdapat seroprevalens sifar dalam Program Ladang Angkat FPV, UPM, yang bebas daripada 'Meloidosis'.

Kata kunci: Meloidosis, Seroprevalence, Uji Fiksasi Komplemen, Ladang Angkat UPM

ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine (FPV) in partial fulfilment of the course VPD 4999 - Project.

**SEROPREVALENCE OF MELIOIDOSIS AMONG CATTLE IN FOSTER
FARM PROGRAMME OF FPV, UPM.**

By

Muhamad Syazrin Bin Abd Kadir

2017

Penyelia: Prof.Dr Abdul Rahman Omar

Penyelia bersama: Assoc Prof.Dr Jesse Faez Firdaus Abdullah

In the endeavour to advance Malaysia into a 'halal' hub the livestock animals should be free from infectious disease. Melioidosis is endemic in South-East Asia and northern Australia. The disease is also a significant animal health that reduces the productivity of animals and loss of valuable animal protein. A previous study on the seroprevalence of Melioidosis in livestock animals in 2000-2009 was carried out by the Department of Veterinary Services Malaysia indicate evidence of 100,262 animals tested, a total of 5,729 (5.7%) were positive for Melioidosis. Since then there was no follow-up study. This study focuses on seroprevalence of Melioidosis in Foster Farm

Programme of FPV, UPM. Fifty cattle with mix-age and gender were selected randomly for bloodsample collection from the Foster Farm Programme of FPV, UPM. Complement Fixation Test (CFT) was used to detect antibody against melioidosis. The result from CFT showed negative for all samples obtained from Foster Farm Programme FPV, UPM. The lack of positive case probably due to small sample number and also related to the management practices where the cattle mostly kept under a semi-intensive system in which they had less contact with soil and therefore at a lower risk of contracting the organism. This indicates there is zero seroprevalence in Foster Farm Programme FPV, UPM, which is free of Melioidosis.

Keywords: Melioidosis, Seroprevalence, Complement Fixation Test. Foster Farm UPM

1.0 INTRODUCTION

Melioidosis is a saproozoonosis caused by soil saprophytic bacterium *Burkholderia pseudomallei*. The disease is endemic in Southeast Asia and northern Australia (Puthuchery et.al 1995). It is a significant public health problem because of its propensity to affect poor rural populations, immune-suppressed individuals and the death in facilities for its accurate diagnosis in the affected regions (Inglis and Sousa, 2009). The disease is also a significant animal health problem leading to chronic debility that reduces the productivity of animals and loss of valuable animal protein due to the condemnation of carcasses at the abattoir (Ketterer et.al 1986). Moreover, it is an emerging infectious disease with serious public health implications in most countries (Center for Food Security and Public Health, 2003). The disease is mostly transmitted through ingestion and inhalation of contaminated water and/or soil. Transmission occurred when infected animal body fluids such as urine, milk or nasal secretion or blood came into direct contact with susceptible hosts depending on the site of infection or through contact with infected soil or water (Bettey et al, 2002; Center for Food Security and Public Health, 2003); as well infection appears to be the inhalation and aspiration of contaminated dust particles (Thomas et al, 1988).

Subclinical diseases are regular in the animal, and asymptomatic abscesses might be found at slaughter. Symptomatic melioidosis might be acute, subacute or chronic, and mild or severe. The lungs, spleen, liver and related lymph nodes are regularly involved in the animal, yet any organ can be influenced. Melioidosis has rarely been described in cattle. Most cases in adult cattle have been chronic. Fever,

dyspnea, continuous profuse salivation and neurologic signs were reported in one animal. (The Center for Food Security & Public Health, 2016). At necropsy, the major findings are multiple abscesses containing thick, caseous, greenish-yellow or off-white material. The Center for Food Security & Public Health of Iowa State University also stated that the abscesses are generally not calcified and the regional lymph nodes, lungs, spleen, liver and subcutaneous tissues are most often involved, but abscesses can occur in most organs.

Data from Department of Veterinary Services Malaysia stated that from the year 2000 to the year 2009 the seroprevalence rate in animals was 7.6, 48.2, 2.6, 13.6 and 3.6% in cattle, buffaloes, goats, sheep and pigs respectively. The seroprevalence of the disease varies in different states of the federation. For all species, the seroprevalence varies between 2.6% and 48.2%. The seroprevalence over the years increased from 4.2% in 2000 to 12.0% in 2003 after which it varies between the period 2004 - 2007 and apparently declined between 2007 and 2009. In veterinary diagnosis, serology has always been used for detection *Burkholderia pseudomallei* whereby anti-*Burkholderia* antibodies are detected in cattle (Malaysian Journal of Veterinary Research, 2012). From the international conference on One Health and 24th VAM Congress 2012, there is a retrospective study which was carried out to collect data on total number livestock were recorded positive for Melioidosis in Malaysia on 2007 to 2011. The study was based on documented confirmed cases of Melioidosis that occurred in Malaysia in the 5 years from January 2007 until December 2011. All data were extracted from Laboratory Information and Management System, VRI (LIMS).

The complement fixation test is one of the major conventional tests for the demonstration of the presence of specific antigens or antibodies (Acharya, 2016). In the positive test, the available complement is fixed by antigen-antibodies complex and no haemolysis of red blood cell (RBC)s occurs. Therefore the test is positive for the presence of antibodies. In the negative test, there is no antigen-antibodies reaction occurs and the complement is free. The free complement binds to the complex of RBC and its antibody causes haemolysis and the development of pink colour (Giri, 2015)

There were no screening up to date have been conducted on Melioidosis status among cattle under the Foster Farm Programme of The Faculty of Veterinary Medicine (FPV) Universiti Putra Malaysia (UPM). Thus, this study was designed to obtain the current status of seroprevalence of Melioidosis among cattle under the Foster Farm Programme FPV, UPM. This study also will identify the risk factor and its association towards the seroprevalence of the Melioidosis in the selected cattle farms in Foster Farm Programme FPV, UPM.

It is important to know the current status of Melioidosis in Foster Farm Programme FPV, UPM for biosecurity, planning of herd health programme and safety of students, staff and farm workers as Melioidosis in zoonotic and importance.

Prior to planning detailed HHP, all the importance disease status such as Melioidosis is needed.

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