



UNIVERSITI PUTRA MALAYSIA

***SEROPREVALENCE OF ORF VIRUS INFECTION AMONG SMALL
RUMINANTS IN UPM'S FOSTER FARMS
BASED ON IgG ANTIBODY DETECTION***

LIM CHENG YI

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**SEROPREVALENCE OF ORF VIRUS INFECTION AMONG SMALL
RUMINANTS IN UPM'S FOSTER FARMS
BASED ON IgG ANTIBODY DETECTION**

LIM CHENG YI

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

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

Universiti Putra Malaysia,
Serdang, Selangor Darul Ehsan.

MARCH 2017

CERTIFICATION

It is hereby certified that we have read this project paper entitled “Seroprevalence of Orf Virus Infection Among Small Ruminants in UPM’s Foster Farms Based on IgG Antibody Detection”, by Lim Cheng Yi 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

This project paper is dedicated

To my parents,

For their never ending support and affection

To my sisters,

For their humor

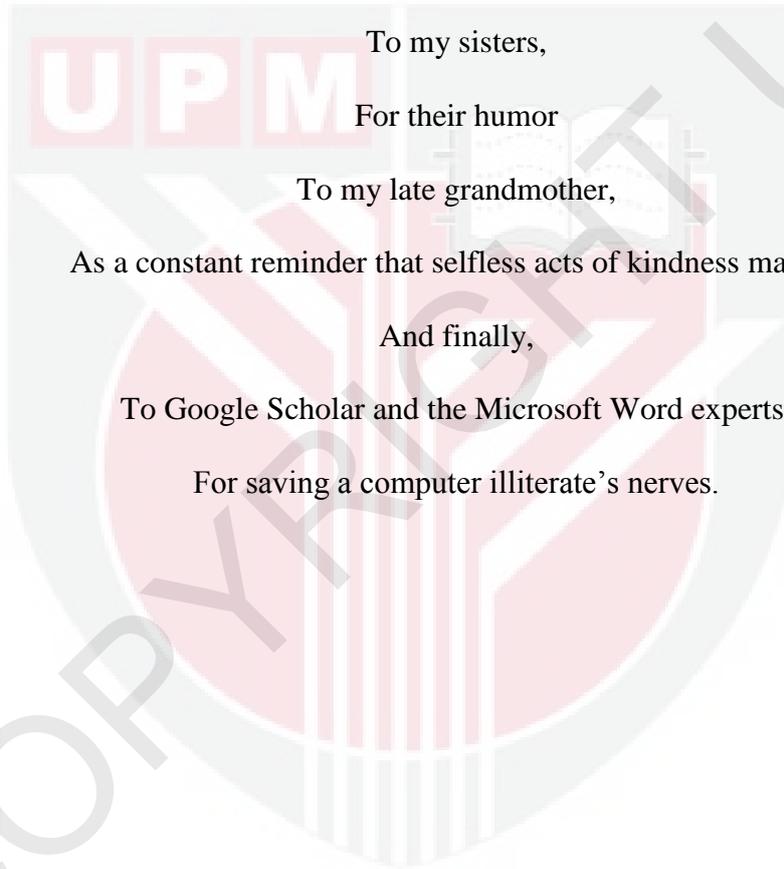
To my late grandmother,

As a constant reminder that selfless acts of kindness matters

And finally,

To Google Scholar and the Microsoft Word experts,

For saving a computer illiterate's nerves.



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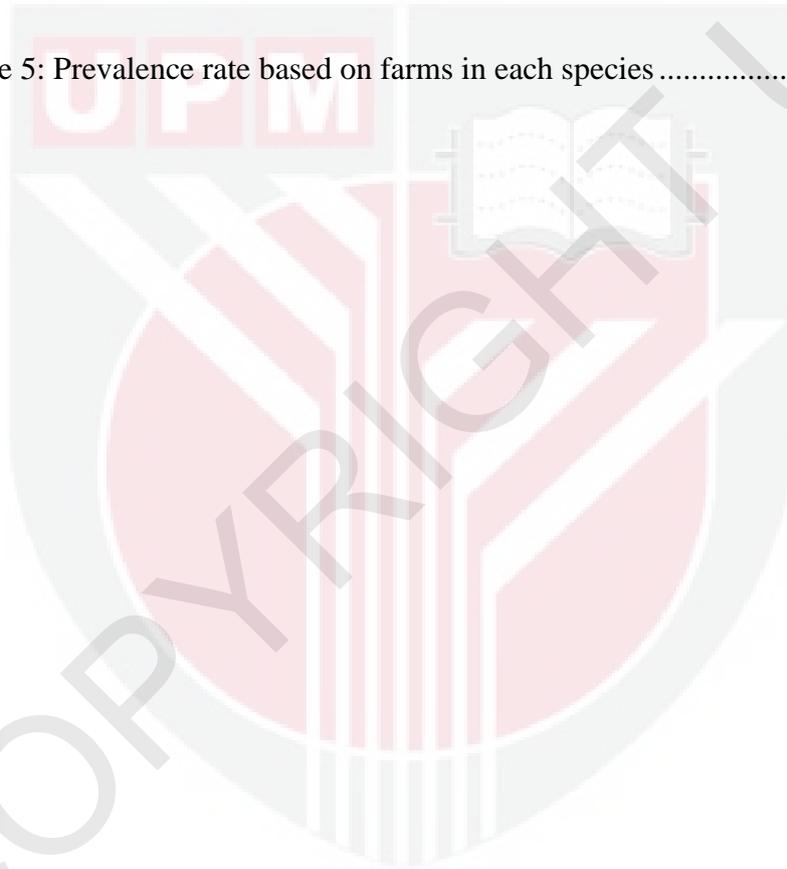
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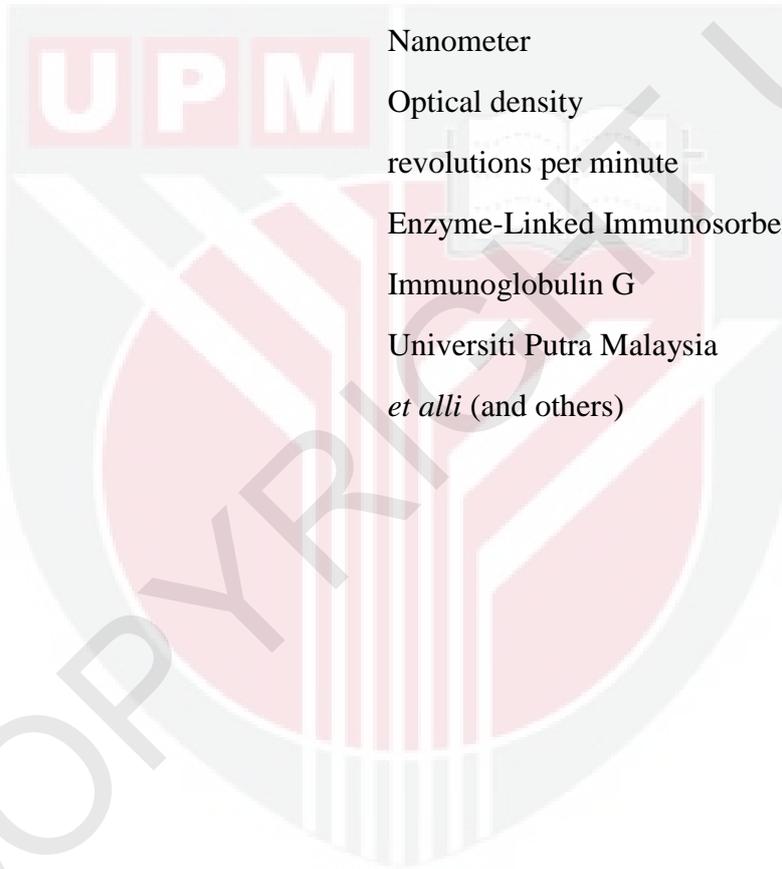
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LIST OF ABBREVIATIONS

%	Percent
°C	Celsius
kg	Kilogram
uL	Microlitre
ml	Milliliter
nm	Nanometer
O.D.	Optical density
rpm	revolutions per minute
ELISA	Enzyme-Linked Immunosorbent Assay
IgG	Immunoglobulin G
UPM	Universiti Putra Malaysia
<i>et al.</i>	<i>et alli</i> (and others)



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ABSTRAK

Abstrak daripada kertas kerja yang dikemukakan kepada Fakulti Perubatan Veterinar, Universiti Putra Malaysia untuk memenuhi sebahagian daripada keperluan kursus VPD 4999- Projek Ilmiah Tahun Akhir.

**KAJIAN SERUM JANGKITAN VIRUS ORF DALAM TERNAKAN
RUMINAN KECIL DARI PROGRAM LADANG ANGKAT UPM
BERASASKAN PENGESANAN ANTIBODI IgG**

Oleh

Lim Cheng Yi

2017

Penyelia: Prof. Dato' Dr. Mohd Azmi Mohd Lila

Penyelia Bersama: Assoc Prof. Dr. Faez Firdaus Jesse Abdullah

Penyakit ektima menular merupakan penyakit berjangkit yang disebabkan oleh virus Orf yang bercirikan luka berkeruping terutamanya di bahagian hidung dan mulut. Ia mendatangkan kerugian ekonomi yang besar akibat tumbesaran haiwan yang terlibat terbantut dan sejurusnya dilupuskan. Buat masa ini, Malaysia kekurangan maklumat mengenai status jangkitan jangka panjang Orf dalam negara. Tujuan kajian ini adalah untuk mengesan antibodi IgG terhadap virus Orf dalam kalangan ternakan biri-biri dan kambing dari Program Ladang Angkat UPM. Faktor risiko terlibat dalam jangkitan

Orf juga ditaksirkan. Sampel serum 90 biri-biri dan 90 kambing; bersama dengan perihal maklumat berkaitan diambil dari 5 ladang yang dipilih secara rawak. Sampel serum disimpan dalam suhu -20°C dan sejarusnya dijalankan ujian kualitatif Enzyme-Linked Immunosorbent Assay (ELISA) test. 12.22% populasi biri-biri dan 14.44% populasi kambing didapati sudah dijangkiti virus Orf. Bagi data biri-biri, analisis statistik menunjukkan bahawa terdapat perbezaan yang signifikan ($p < 0.05$) dalam kadar prevalens menurut perbezaan jantina, umur dan ladang. Kadar prevalens bagi jantan lebih tinggi daripada betina. Haiwan muda menunjukkan kadar prevalens yang lebih tinggi daripada haiwan dewasa. Ladang yang dikendalikan secara tidak memuaskan menunjukkan kadar prevalens yang paling tinggi ketika dibandingkan dengan ladang lain. Kesimpulannya,, jangkitan jangka panjang Orf boleh didapati dalam ternakan biri-biri dan kambing dari Program Ladang Angkat UPM; di mana kadar prevalens Orf dalam populasi kambing adalah lebih tinggi daripada biri-biri.

Kata kunci: Penyakit ektima menular, Orf, kadar prevalens, factor risiko, IgG, ELISA

ABSTRACT

Abstract of the project paper presented to the Faculty of Veterinary Medicine in partial requirement for the course VPD 4999 – Final Year Project

SEROPREVALENCE OF ORF VIRUS INFECTION AMONG SMALL RUMINANTS IN UPM'S FOSTER FARMS BASED ON IgG ANTIBODY DETECTION

By

Lim Cheng Yi

2017

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Assoc Prof. Dr. Faez Firdaus Jesse Abdullah

Contagious ecthyma is an infectious disease caused by Orf virus; characterized by scabby lesions at the nostrils and mouth regions. It results in huge economic losses due to stunted growth or slaughter of the affected animals. There is inadequate information on the status of long-term Orf infection among small ruminants in Malaysia. This study aimed to detect the IgG antibodies against Orf virus infection in goats and sheep of selected UPM's Foster Farms. Associated risk factors of Orf infection were also assessed. Serum samples of 90 sheep and 90 goats, together with relevant historical information were obtained from 5 randomly selected farms. Serum

samples were stored at -20°C and subjected for qualitative Enzyme-Linked Immunosorbent Assay (ELISA) test. It was found that 12.22% sheep and 14.44% goat population were already infected by Orf. In sheep, statistical analysis indicated there was a significant difference ($p < 0.05$) in prevalence rate among genders, ages and farms. The prevalence rate in males was higher than in females. Young animals showed higher prevalence than in adults. Poorly managed farm was the highest compared to other farms. In conclusion, Orf infection is present in sheep and goats from UPM's Foster Farms with prevalence rate in goats higher than in sheep.

Key words: *Contagious ecthyma, Orf, risk factor, prevalence rate, IgG, ELISA*

1.0 INTRODUCTION

Contagious ecthyma is an infectious skin disease caused by Orf virus distinctively characterized by scabby lesions at facial regions such as the nostrils and mouth. It is also known as contagious pustular dermatitis, scabby mouth, sore mouth or Orf (Fleming *et al.*, 2015). Orf should not be mistaken as Foot and Mouth Disease or Bluetongue Disease as symptoms appear similar (McInnes, 2010). It has a wide host range affecting sheep, goats and other wild animals such as alpacas, camels and reindeer.

The morbidity of the disease can reach up to 100% and mortality due to secondary causes may reach 15% (Ramesh *et al.*, 2008; Bora *et al.*, 2012). Secondary causes are such as lesions on the mouth in offspring interfering with suckling; leading to death due to starvation (Nandi, 2011). Weight loss have been reported in survived offspring. Marketability of sheep and goats for trading or slaughtering for meat purposes also declines due to nasty dermatological lesion.

It also has zoonotic concern as humans can also be infected through open wounds and cuts (Buttner & Rhiza, 2002). Lesions are caused by direct inoculation of infected material and usually develops locally at the hands. The occurrence is high among farm personnel during lambing, docking, shearing or slaughtering of positively infected animals (Nandi *et al.*, 2011).

According to Nandi *et al.*, vaccination is the only choice to control the Orf effectively. Along with strict sanitation practise, vaccination reduced the disease to

none by 1969 in Egypt (El-Dahaby *et al.*, 1969). However, the use of vaccine is controversial as outbreaks still occurred in vaccinated animals (Kumar *et al.*, 2015).

A study was performed in Assam to determine the seroprevalence of contagious ecthyma in goats (Mousumi *et al.*, 2016) using traditional indirect Enzyme Linked Immunosorbent Assay (ELISA). Sandwich ELISA is proven to be a better alternative as samples do not have to be purified prior analysis. Currently, there has been increasing number of commercial ELISA pair sets built on sandwich ELISA.

There has been reported Orf disease outbreak throughout the years in Malaysia (Zamri *et al.*, 1992; Abdullah, 2015). However, there is inadequate information on seroprevalence for past infection of Orf among small ruminants in Malaysia. Immunoglobulin G; or better known as IgG can be used as a recognition tool to determine if animals have been exposed to the same antigen before; henceforth enabling detection of past infection.

For this research, the following hypotheses were proposed:

1. The goats and sheep in UPM's Foster Farms, Malaysia have previous antibody against Orf.
2. There are seroprevalence of Orf according to several risk factors among small ruminants in UPM's Foster Farms, Malaysia.

Therefore, the objectives of this study are:

1. To detect the presence of past IgG antibodies against Orf virus in goats and sheep in UPM's Foster Farms, Malaysia.
2. To identify the seroprevalence of Orf according to several risk factors among small ruminants in UPM's Foster Farms, Malaysia.



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