MEASUREMENT OF IgA AND IgG FROM BRONCHOALVEOLAR LAVAGE FOLLOWING INTRATRACHEAL EXPOSURE OF FORMALIN KILLED *Pasteurella multocida* B2 IN GOATS

TANG CHUI SENG

FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

2005

Lihat sebelah

MEASUREMENT OF IgA AND IgG FROM BRONCHOALVEOLAR LAVAGE FOLLOWING INTRATRACHEAL EXPOSURE OF FORMALIN KILLED *Pasteurella multocida* B2 IN GOATS

by

Tang Chia Seng

Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Biological Sciences)

Department of Biological Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005

This project should be cited as:

Tang, C.S. 2005. Measurement of IgA and IgG from bronchoalveolar lavage following intratracheal exposure of formalin-killed Pasteurella multocida B2 in goats. Undergraduate thesis, Bachelor of Science in Biological Sciences, Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 65p.

JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: Measurement of IgA and IgG from bronchoalveolar lavage following intratracheal exposure of formalin-killed *Pasteurella multocida* B2 in goats oleh Tang Chia Seng, No. Matrik: UK 6658 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Bacelor Sains (Sains Biologi), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

.....

Penyelia Utama

Nama: Prof. Madya Dr. Effendy Abdul Wahid

Cop Rasmi: Prof. Madya Dr. Mohd Effendy b. Abd. Wahid
Pensyarah
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu, Terengganu.

Tarikh: 25/4/05

.....

Ketua Jabatan Sains Biologi

Nama: Prof. Madya Dr. Nakisah Mat Amin

Cop Rasmi: PROF. MADYA DR. NAKISAH BT. MAT AMIN
Ketua
Jabatan Sains Biologi
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu.

Tarikh: 26/4/05

ACKNOWLEDGEMENT

I would like to take this opportunity to say my heartiest thanks my beloved supervisor, Assoc. Prof. Dr. Mohd Effendy Abdul Wahid who guided me during and after the field works and laboratory works. Special thanks to En. Muhammad Embong who guided me in the laboratory as well as helped to monitor the goats used in my project when I was not attending classes. He taught me a lot about how to take care of the goats and what kind of plants or leaves that the goats like to eat. Gratitude also goes to Pn. Zarina and Pn. Mahidawati who taught me how to use all materials and equipments during my long hours of lab work. Without them, this project would not be as successful.

I would also like to extend my deepest appreciation to Siti Tafsil Raudah, Kak Tirah, and Kien Wooi who helped during the slaughtering of the goats. My special gratitude to Kak Odah who had helped me, particularly, and the others in finishing our project. Her dedication and willing-to-teach attitude made her easy to be approached and easily contacted when I am in need of help and guidance. Thanks also to Parimala who guided and helped me a lot when doing ELISA.

To each and everyone in who are doing final year project under Dr. Effendy, be it the intranasal group or intratracheal group, thank you for giving full co-operation during this project was being done. Special thanks to everyone in the intratracheal group for helping in taking care of the goats. I will not ever forget the mornings when we have

to come early to the 'Animal House' to check on the goats, feed them, clean the 'Animal House' and cut the grass!

Specially for my beloved parents who had always been supportive and understanding of the problems that I'm facing in completing this thesis. Last but not least, in order not to forget anyone, this goes out to everyone who was involved in the process of doing this report, directly or indirectly. Once again, thank you!!

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF CHARTS

LIST OF ABBREVIATIONS

%	percent
BALF	broncho-alveolar lavage fluid
BALT	bronchus-associated lymphoid tissue
BHIB	brain-heart infusion broth
Cfu	colony forming unit
CTL	cytotoxic T-lymphocytes
ELISA	enzyme-linked immunosorbent assay
H_o	null hypothesis
H_α	alternative hypothesis
Ig	Immunoglobulin
IT	intratracheal
m	meter
m^2	meter square
M	molar
ml	milliliter
NALT	nasal-associated lymphoid tissue
nm	nanometer
°C	degree Celsius
P.	*Pasteurella*
PBS	phosphate buffer saline
SIgA	secretory IgA
µm	micrometer

LIST OF APPENDICES

ABSTRACT

A study to determine the immunoglobulin (Ig) responses in the lower respiratory tract of goats following intratracheal (IT) exposures to formalin-killed bacteria, *Pasteurella multocida* (*P. multocida*) B2 was carried out. Six clinically healthy goats were divided into two groups. Goats in Group 1 were subjected to IT exposure to formalin-killed *P. multocida* B2 while goats in Group 2 were the unexposed control. At the end of a two-week exposure, all goats were slaughtered and the lungs were flushed with 50 ml 0.8% normal saline. The bronchoalveolar lavage fluid (BALF) samples were subjected to enzyme-linked immunosorbent assay (ELISA) to determine the levels of IgA and IgG. IgA levels in the BALF were not significantly ($p > 0.05$) high. IgG levels were also not at a significantly ($p > 0.05$) high level.

PENENTUAN ARAS IgA DAN IgG DARIPADA BRONCHOALVEOLAR LAVAGE KAMBING MELALUI PENDEDAHAN SECARA INTRATRACHEAL TERHADAP BAKTERIA *Pasteurella multocida* B2 YANG TELAH DINYAHAKTIF OLEH FORMALIN.

ABSTRAK

Suatu kajian telah dijalankan bagi menentukan tindakbalas immunoglobulin (Ig) dalam saluran pernafasan kambing melalui pendedahan secara intratracheal (IT) terhadap bakteria *Pasteurella multocida* (*P. multocida*) B2 yang telah dinyahaktif oleh formalin. Enam ekor kambing dibahagikan kepada dua kumpulan. Kambang-kambing dalam Kumpulan 1 didedahkan kepada *P. multocida* B2 yang telah dinyahaktif oleh formalin, manakala kambing-kambing Kumpulan 2 pula adalah sebagai kawalan. Selepas pendedahan selama dua minggu, kesemua kambing disembelih dan peparu kambing tersebut dicuci dengan 50 ml larutan garam 0.8%. Sampel-sampel cecair 'bronchoalveolar' dikaji aras IgA dan IgG dengan menggunakan immunoasai berenzim (ELISA). Aras kedua-dua Ig yang dikaji, iaitu IgA dan IgG dalam BALF adalah tidak signifikan ($p < 0.05$).