

IMMUNE RESPONSE OF BRONCHO ALVEOLAR LAVAGE TOWARDS
INTRANASAL EXPOSURE OF
Pasteurella multocida B2 IN GOATS

HANAFI BIN ANUWAR

FAKULTI SAINS DAN TEKNOLOGI
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005

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INTRANASAL EXPOSURE OF *Pasteurella multocida* B2 IN GOATS

By

Hanafi bin Anuwar

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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: Immune Response of Broncho Alveolar Lavage Towards Intranasal Exposure of *Pasteurella Multocida* B2 in Goats, oleh Hanafi bin Anuar, Matrik UK 6703 telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains Gunaan (Pemuliharaan dan Pengurusan Biodiversiti), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

Penyelia Utama

Nama: **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: 9 April 2025

Ketua Jabatan Sains Biologi

Nama:

Cop Rasmi:

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

Tarikh: 10/4/2025

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LIST OF ABBREVIATIONS

Symbol	Meaning
H_0	Null hypothesis
H_a	Alternative hypothesis
cfu	Colony per unit
rpm	Round per minute
<i>et al.</i>	And others (Latin)

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ABSTRACT

Pasteurella multocida B2 which is associated with Haemorrhagic Septicaemia (HS) has caused a serious disease to large ruminants and caused great economic losses in the Southeast Asia. The accepted method of HS control throughout the world is by vaccination. In this study, the immunoglobulin (IgG and IgA) responses in the lung lavage fluids of goats following intranasal exposure to formalin-killed *Pasteurella multocida* B2 was determined. Thirteen goats were divided into 3 groups. Goats in Group 1 were subjected to once intranasal exposure to formalin-killed *Pasteurella multocida* B2 while goats in Group 2 were subjected to double intranasal exposure to the same organisms. Goats in Group 3 were the unexposed control. At day 15, goats in Group 1 were killed while goats in Group 2 and Group 3 were killed at day 29. Their lungs were flushed with normal saline to collect the samples. These lung lavage fluids were subjected to enzyme-linked immunosorbent assay (ELISA) to determine the levels of IgG and IgA. The IgG levels in the lung lavage fluids increased insignificantly ($p>0.05$) after the first exposure and reach a significantly ($p<0.05$) high level following the second exposure. IgA levels increased significantly ($p<0.05$) after the first exposure but declined to the lowest levels following the second exposure. This stimulation of mucosal immune responses using intranasal presentation of formalin-killed *Pasteurella multocida* B2 has shown great promise for inducing protective immunity to respiratory pathogens.

**TINDAKBALAS IMUN DI DALAM CECAIR PEPARU KAMBING TERHADAP
PENDEDAHAN *Pasteurella multocida* B2 SECARA INTRANASAL**

ABSTRAK

Pasteurella multocida B2 yang mengakibatkan Haemorrhagic Septicemia (HS) telah menyebabkan penyakit yang serius terhadap ruminan serta mengakibatkan kerugian ekonomik yang besar di Asia Tenggara. Vaksinasi merupakan kaedah yang digunapakai di seluruh dunia dalam mengawal penyakit ini. Dalam kajian ini, tindakbalas immunoglobulin (IgA dan IgG) di dalam cecair peparu terhadap *Pasteurella multocida* B2 yang dimatikan dengan formalin dikenalpasti melalui intranasal. Tiga belas ekor kambing telah dibahagi kepada 3 kumpulan. Kambing-kambing di dalam Kumpulan 1 telah didedahkan kepada *Pasteurella multocida* yang dimatikan ini sekali, manakala kambing-kambing di dalam Kumpulan 2 telah diberi dedahan berganda. Kambing-kambing di dalam Kumpulan 3 merupakan kawalan. Pada hari ke-15, kesemua kambing di dalam Kumpulan 1 disembelih manakala kambing-kambing di dalam Kumpulan 2 dan Kumpulan 3 disembelih pada hari ke-29. Peparu kambing-kambing tersebut dimasukkan dengan normal saline untuk diambil sampelnya. Enzyme-linked immunosorbent assay (ELISA) digunakan untuk mengenalpasti tahap IgG dan IgA di dalam cecair peparu yang diambil ini. Tahap IgG dalam cecair peparu meningkat selepas dedahan pertama dan meningkat lagi dengan nyata ($p < 0.05$) selepas dedahan kedua. Tahap IgA dalam cecair peparu pula

meningkat dengan nyata ($p < 0.05$) selepas dedahan pertama tetapi menurun ke paras terendah selepas dedahan kedua. Rangsangan tindakbalas sistem imun mukosal ini terhadap *Pasteurella multocida* B2 menjanjikan peningkatan tahap keimunan terhadap patogen.