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PATHOGENS CAUSING BOVINE MASTITIS IN SELECTED FARMS IN LABIS, JOHOR

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PATHOGENS CAUSING BOVINE MASTITIS IN SELECTED FARMS IN LABIS, JOHOR

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DEDICATION

This project is dedicated to:

- Dad (S.efendi B. S.Ahmad)
- Mum (Kapsiahbt. Bain)
- Brothers (Ridzuan&Hazrir)
- Sisters (Roziah, Ismadora, Hazira, Haryani, Aziani)
- Lecturers of Veterinary Faculty, UPM
- Special friend (Nazreen Usri)
- All my friends

It is hereby certified that we have read this project paper entitled "Pathogens Causing Bovine Mastitis in Selected Farms in Labis, Johor", by Ayunarni binti S Efendi and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfilment of the requirement for the course VPD4999 – Final Year Project.

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ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fullfilment of the course VPD 4999- Project

PATHOGENS CAUSING BOVINE MASTITIS IN SELECTED FARMS IN LABIS, JOHOR.

By

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2016

Supervisor: Assoc. Prof.Dr.ZunitaZakaria

This study was conducted to determine the prevalence and bacteriological assessment of subclinical mastitis and antimicrobial resistance of bacterial isolates from dairy cows in selected farms in Labis, Johor. A total of 128 samples were collected from four farms and tested using California Mastitis Test (CMT). Thirty four (26.56%) milk samples were found to be positive and subsequently subjected to bacterial culture and identification. A total of seven bacteria species were successfully isolated from the samples. The most prevalent bacteria was *Staphylococcus aureus* (41.67%), followed by *Staphylococcus intermedius* (27.10%) and *Streptococcus uberis* (10.40%), *Staphylococcus shleiferi* (8.33%) and *Aerococcusviridans 2* (8.33%). The other two bacteria

are *Corynebacteriumsp.* and *Chromobacterium sp.*; both having 2.10% prevalence. In general, the antibiotic susceptibility test displayed variable susceptibility against tested antibiotics. *Staphylococcus aureus* showed highest resistance *at* 92.60%, 88.89%, 74.08%, 66.67% and 14.82% towards gentamycin, streptomycin, tetracyline, penicillin G and oxytetracycline respectively. *Staphylococcus intermedius* are 100% resistant against gentamycin, streptomycin, 84.62% against tetracycline, 54.85% against penicillin G and 30.77% against oxytetracycline. It was found that most of the isolated bacteria are sensitive towards oxytetracycline, therefore making the antibiotic the most effective among the five tested antibiotic. This study indicates the need for urgent and effective control measures to tackle the increase in prevalence of subclinical mastitis and their antimicrobial resistance in the study area.

Keywords: Mastitis, prevalence, antibiotic sensitivity test, cattle farms

ABSTRAK

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

PATOGEN YANG MENYEBABKAN MASTITIS LEMBU TENUSU DI LADANG TERPILIH DI LABIS, JOHOR

Oleh

Ayunarni Bt. S Efendi

2016

Penyelia: Prof.MadyaDr.ZunitaZakaria

Kajian ini dijalankan untuk menentukan prevalens dan penilaian bakteriologi mastitis subklinikal dan rintangan antimikrob daripada pencilan bakteria daripada lembu tenusu di ladang terpilih di Labis, Johor. Sebanyak 128 sampel telah diambil dari empat ladang dan diuji menggunakan California Mastitis Test (CMT). Tiga puluh empat (26.56%) sampel susu didapati positif dan seterusnya spesies bakteria di tentukan. Sebanyak tujuh spesies bakteria telah berjaya diasingkan daripada sampel. Bakteria yang paling lazim adalah *Staphylococcus aureus* (41,67%), diikuti oleh *Staphylococcus intermedius* (27.10%) dan *Streptococcus uberis* (10.40%), *Staphylococcus shleiferi* (8.33%) dan *Aerococcus viridans 2* (8.33%).

Corynebacterium sp. dan *Chromobacterium sp.* kedua-duanya mempunyai 2.10% kelaziman. Secara umum, ujian kerentanan antibiotik menunjukkan kecenderungan berubah-ubah terhadap antibiotik yang diuji. *Staphylococcus aureus* menunjukkan rintangan tertinggi pada 92.60%, 88.89%, 74.08%, 66.67% dan 14.82% ke arah gentamycin, streptomycin, tetracyline, penicillin G dan oxytetracycline masing-masing. *Staphylococcus intermedius* adalah 100% tahan terhadap gentamycin dan streptomycin, 84.62% terhadap tetracycline, 54.85% terhadap penicillin G dan hanya tahan sebanyak 30.77% terhadap oxytetracycline. Kajian ini telah mendapati bahawa kebanyakan bakteria sensitif terhadap oxytetracycline, oleh itu menjadikan oxytetracycline sebagai antibiotik yang paling berkesan antara lima antibiotik yang di uji. Kajian ini menunjukkan keperluan untuk langkah-langkah kawalan segera dan berkesan untuk menangani peningkatan dalam kelaziman mastitis subklinikal dan rintangan antimikrob dalam kawasan kajian.

Kata kunci: Mastitis, kelaziman, ujian sensitiviti antibiotik, ladang lembu

1.0 INTRODUCTION

Mastitis is one of the important production diseases of dairy animals which directly or indirectly affects the economy of the farmers and ultimately affect the economy of the country (Sharma et. al., 2014). Mastitis is inflammation of the mammary gland affecting all species of domestic animals and is of great concern to the dairy industry. The disease is characterised by the inflammation of the mammary gland that is caused by bacterial infections. Economic losses associated with mastitis is derived mainly from a decrease in milk production and to a lesser extent, from the culling of chronically infected cows, cost of veterinary treatment, and penalties on milk quality (Seegers et al., 2003). Organisms responsible for causing mastitis are classified into environmental and contagious bacteria (Hamadani et al. 2013). Contagious mastitis infections are acquired by transmission of contagious bacteria from cow to cow during the milking process while for environmental infections it is acquired from bacteria in the environment. Contagious mastitis can be further categorised into subclinical, clinical, acute, acute gangrenous and chronic mastitis (Zoetis, 2013). In general, the most common organisms found in milk samples are *Staphylococcus aureus, Streptococcus uberis, Escherichia coli, Pseudomonas spp., Mycoplasma sp.* and coagulase-negative staphylococci. Researches on bovine mastitis have been carried out since the last seven decades but unfortunately, the problem remains especially for field veterinarians in treat and control (Sharma et. al., 2012).

Even though mastitis is common, up to date information is lacking in terms of the major causing bacteria causing mastitis. By collecting samples of the milk produced by cows suffering from the symptoms of mastitis, and indeed samples of cows identified as having high Somatic Cell Counts (SCC), it enables to identify which pathogen or pathogens are to blame, in order to target effective treatment. Besides to target for the effective treatment, appropriate control measures can be implemented on the farm to reduce the incidence of the disease.

According to Aarestrup (2005), antimicrobials are routinely used for treatment of dairy cattle affected with clinical and subclinical infections. The use of antimicrobials have, over time, increased the number of antimicrobial-resistant microbes globally, and any use of these agents will to some extent benefit the development of resistant strains. Inappropriate usage of antimicrobials such as wrong dose, drug or duration may contribute the most to the increase in antimicrobial resistance (Williams, 2000).

This study aims to determine the types of pathogens that are currently causing mastitis at four selected farms in Labis, Johor. This information can be used in designing appropriate and effective treatment to the infected cows. This study also aims to determine the presence of antibiotic resistant organisms among the pathogens. Presence of resistant pathogens may become a challenge in treatment. The objectives of this study were:

1. to identify the most common pathogens causing mastitis in cows.

2. to determine the antibiotic susceptibility of the pathogens against antibiotics.

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