UNIVERSITI PUTRA MALAYSIA

CARRIAGE OF Salmonella spp. and Escherichia coli BY HOUSE FLIES AT THREE EATERIES AROUND UNIVERSITI PUTRA MALAYSIA (UPM) AND THREE POULTRY FARMS IN SELANGOR

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A project paper submitted to the
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CERTIFICATION

It is hereby certified that we have read this project paper entitled "Carriage of *Salmonella* Spp. And *Escherichia coli* by House Flies At Three Eateries around University Putra Malaysia (UPM) and Three Poultry Farms in Selangor", by E Alvwina Julian and in our opinion it is satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the course VPD 4990 – Final Year Project.

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An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fulfillment of the course VPD 4999 – Final Year Project.

CARRIAGE OF *Salmonella* spp. AND *Escherichia coli* BY HOUSE FLIES AT THREE EATERIES AROUND UNIVERSITY PUTRA MALAYSIA (UPM) AND THREE POULTRY FARMS IN SELANGOR

By

E Alvwina Julian

2017

Supervisor: Dr. Nur Indah Ahmad

Co-supervisor: Prof. Dr. Saleha Abdul Aziz

House flies are of public health concern for their high potential to be carriers of communicable diseases to both human and animals. There is an urgency to explore if the house flies can carry disease–causing bacteria in their gastrointestinal tract that can greatly amplify the risk of human and animal exposure to diseases. The aim of the present study is to study the carriage of *Salmonella* spp. and *Escherichia coli* by house flies collected from three local eateries that are frequented by students and staffs of University Putra Malaysia (UPM) and from another three poultry farms in Selangor. This study also aims to investigate the evidence of antibiotic resistance of

the isolated bacteria. A total of 60 samples of house flies were caught using sticky papers from three local eateries around UPM and three poultry farms in Selangor. The finding reveals only 3.33% of the total 60 house flies samples collected from both eateries and poultry were confirmed positive for *Salmonella* spp. The positive samples were shown to exhibit antibiotic resistance towards Amoxicillin. This study also revealed that 56.67% of the total 60 house flies samples caught from the three local eateries around UPM and three poultry farms in Selangor carry *Escherichia coli*.Most of the *Escherichia coli* isolateswere found to be resistant to Amoxicillin, Streptomycin and Ceftriaxone. House flies are evidently proven to be able to carry both *Salmonella* spp. and *Escherichia coli* and these bacteria do potentially carry antibiotic resistance gene based on the resistant patterns exhibited.

Keywords: house fly, *Salmonella* spp., *Escherichia coli*, antibiotic resistance

ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek Ilmiah Tahun Akhir Pelajar

PENGANGKUTAN*Salmonella* spp. DAN*Escherichia coli*OLEH LALAT DI TIGA KEDAI MAKAN DI SEKITAR UNIVERSITY PUTRA MALAYSIA (UPM) DAN TIGA LADANG AYAM DI SELANGOR

Oleh

E Alvwina Julian

2017

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Lalat rumah menimbulkan kerisauan terhadap kesihatan awan kerana potensinya yang tinggi sebagai pembawa pelbagai penyakit terhadap manusia danjuga haiwan. Oleh sebab itu, terdapat keperluan untuk menyelidiki sama ada lalat rumah mampu mengangkut patogen di dalam salur pencernaannya. Kemampuan seumpama ini mampu meningkatkan risiko penyebaran penyakit-penyakit bawaan lalat rumah kepada manusia dan haiwan yang sering kali terdedah kepada lalat rumah. Tujuan kajian ini adalah untuk menyelidiki sama ada terdapat pembawaan *Salmonella* spp.

dan *Escherichia coli*oleh lalat rumah di kawasan-kawasan kajian iaitu tiga gerai makan di sekitar Universiti Putra Malaysia dan tiga ladang ayam di sekitar Selangor. Kajian ini juga bertujuan untuk menyiasat sama ada bakteria-bakteria tersebut memperlihatkan bukti adanya daya tahan terhadap antibiotik. Sebanyak 60 sampel terkumpul lalat rumah ditangkap menggunakan kertas lekit di kawasan-kawasan kajian. Sebanyak 3.33% daripada 60 sample tersebut membuktikan terdapat pembawaan*Salmonella* spp. oleh lalat rumah. Sampel-sampel yang positif itu turut memperlihatkan bukti terdapatnya tanda-tanda daya tahan terhadap antibiotik Amoxicillin.Sebanyak 56.67% daripada 60sampel yang sama turut membuktikan bahawa terdapat pembawaan *Escherichia coli* oleh lalat rumah di kawasan-kawasan kajian. Sampel-sampel positif-*Escherichia coli* juga menunjukkan terdapatnya bukti daya tahan terhadap tiga jenis antibiotik yang berbeza iaitu Amoxicillin, Streptomycin dan juga Ceftriaxone. Lalat rumah sememangnya terbukti mampu membawa *Salmonella* spp. dan *Escherichia coli* dan bakteria-bakteria ini menunjukkan bukti-bukti daya tahan terhadap beberapa jenis antibiotik.

Kata kunci: lalat rumah, *Salmonella* spp., *Escherichia coli*, daya tahan antibiotic

1.0 INTRODUCTION

House fly is a well-known pest capable of transmitting numbers of diseases to both humans and animals (Keiding, 1986). House flies are non-biting arthropods that usually breed in animals manure during warm day. Thus, they can easily be found around the world. Studies conducted by Bouamama in Tangier, Morocco in 2010 revealed successful isolation of various bacteria including *Escherichia coli* from the external body of the house flies. However, among all the houseflies caught, only one sample was confirmed positive for *Salmonella* spp. This indicates low carriage of *Salmonella* spp. by house flies in Tangier, Morocco during the sampling period.

Similar studies aimed to investigate the species of bacteria harbored by house flies internally and/or externally were conducted in different countries; India (Gupta *et al*., 2011), Iran (Kassiri *et al*., 2012) and Iraq (Ahmed *et al*., 2012) revealed that *Escherichia coli* were among the commonly isolated bacteria from external and/or internal of the house flies' body. However, there was no *Salmonella* spp. was isolated from either study. This suggested low occurrence of *Salmonella* spp. at all the sampling sites from the mentioned studies. However, these findings should not be overlooked as house flies can still potentially transmit *Salmonella* spp.

Based on the data acquire from the Ministry of Health Malaysia, from the year 2010 to 2015, among all the listed food borne diseases such as cholera, dysentery, food poisoning, typhoid and Hepatitis A; food poisoning was recorded having the highest incidence rate of more than 44% . This data showed that there were high numbers of food poisoning cases every year due to various causes. Hence, this study was designed to study the carriage of *Salmonella* spp. and *Escherichia coli* by house flies

at three local eateries which were frequented by students and staffsof University Putra Malaysia (UPM) and three poultry farms in Selangor. In addition, this study also aimed to investigate whether the positive isolates of *Salmonella* spp. and *Escherichia coli* exhibit resistance toward several selected antibiotics.

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