



UNIVERSITI PUTRA MALAYSIA

***COMPARATIVE STUDY OF THE PESTICIDES AND ANTIBIOTICS
RESIDUE IN DUCK MEAT REARED IN CLOSED HOUSE AND
OPEN HOUSE FREE RANGE SYSTEM***

NUR SYAHIRAH BINTI MOHD TAHAR

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**COMPARATIVE STUDY OF THE PESTICIDES AND ANTIBIOTICS RESIDUE
IN DUCK MEAT REARED IN CLOSED HOUSE AND OPEN HOUSE FREE
RANGE SYSTEM**

NUR SYAHIRAH BINTI MOHD TAHAR

A project paper submitted to the Faculty of Veterinary Medicine, Universiti Putra
Malaysia in partial fulfilment of the requirement for the DEGREE OF DOCTOR OF
VETERINARY MEDICINE Universiti Putra Malaysia Serdang, Selangor Darul Ehsan

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CERTIFICATION

It is hereby certified that I have read this project paper entitled “Comparative Study Of The Pesticides And Antibiotics Residue In Duck Meat Reared In Closed House And Open House Free Range System” by Nur Syahirah binti Mohd Tahar and in my opinion it is satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the course VPD 4999

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DEDICATIONS

This final year project is dedicated to my beloved family, my supervisor, housemates, classmates, all lecturers and friends that were involve either directly or indirectly in this project



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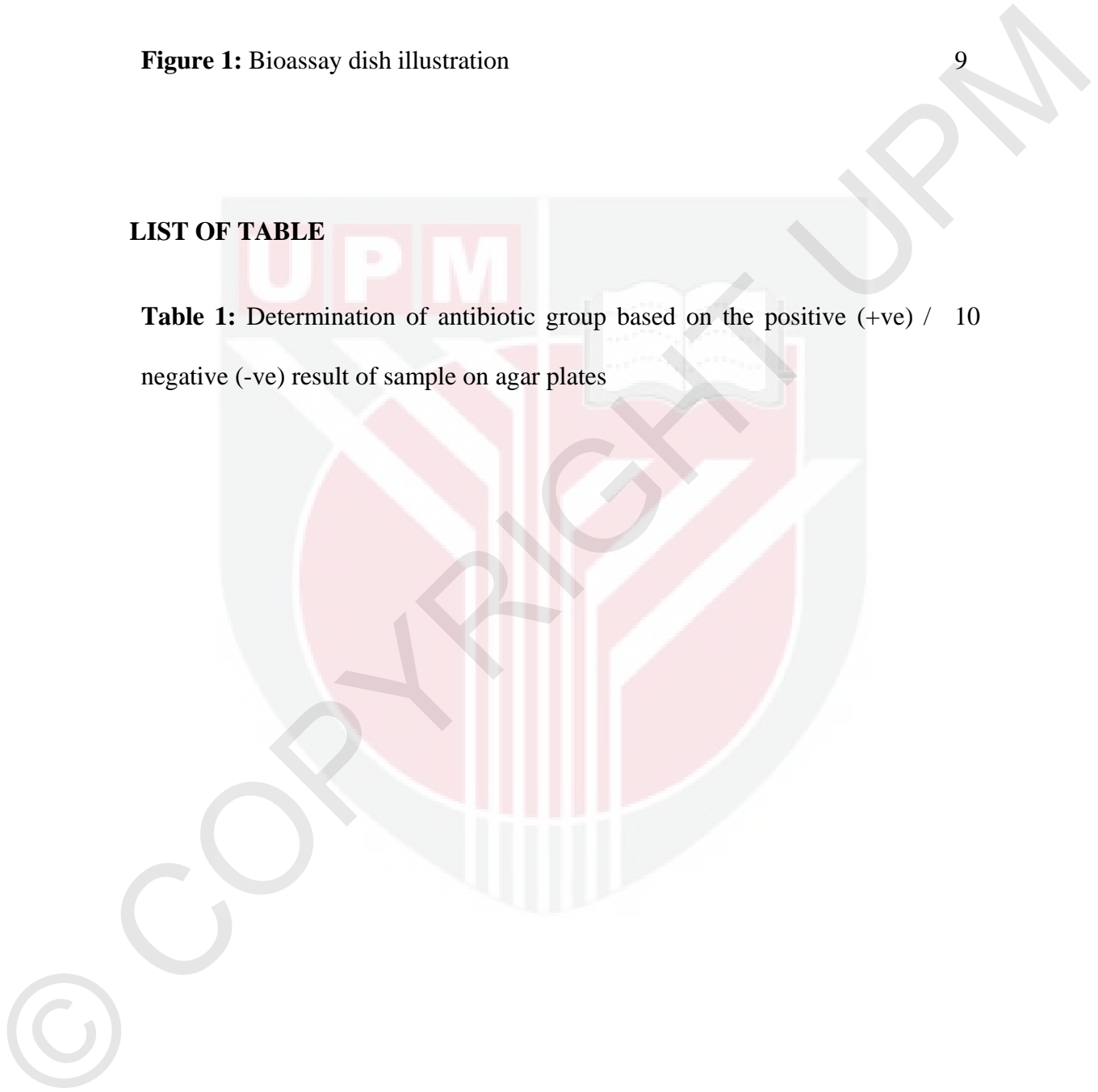
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Figure 1: Bioassay dish illustration

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Table 1: Determination of antibiotic group based on the positive (+ve) / 10
negative (-ve) result of sample on agar plates



ABSTRACT

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

**COMPARATIVE STUDY OF THE PESTICIDES AND ANTIBIOTICS RESIDUE
IN DUCK MEAT REARED IN CLOSED HOUSE AND OPEN HOUSE FREE
RANGE SYSTEM**

by

NUR SYAHIRAH BINTI MOHD TAHAR

2015

Supervisor: Dr. Lokman Hakim Idris

This study compares on antibiotics and pesticides residue in commercial Pekin duck meat from closed house and open house free range system. A total of 16 matured ducks using same type of commercial diet with 8 from each different rearing system were subjected to this study. The antibiotic and pesticides residue experiment was

conducted using six plate test method, ELISA method and QuEChERS method respectively. Six plate test method for screening of qualitative detection of a group of antibiotics in animal tissue; macrolides, aminoglycosides, tetracyclines, sulfonamides, B-lactam and quinolones shows negative result (<2mm or no annular zone around tissue disc) Meanwhile, ELISA method for banned drugs; Chloramphenicol, Nitrofurantoin, Beta-agonist show negative for all samples. QuEChERS method using GC-ECD/GC-MS for pesticide residue; also shows the negative result. Thus, the different rearing method does not contribute to the unnecessary usage of antibiotic; either the duck were affected by the pesticides residue subjected to the ponds in open house free range system.

Keyword: *Pekin duck, Closed house, Open house free range, Antibiotics, Pesticides.*

ABSTRAK

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

KAJIAN PERBANDINGAN DARIPADA SISA RACUN PEROSAK DAN SISA ANTIBIOTIK DALAM DAGING ITIKYANG DITERNAK DI SISTEM REBAN TERTUTUP DAN SISTEM REBAN TERBUKA

oleh

NUR SYAHIRAH BINTI MOHD TAHAR

2015

Penyelia: Dr. Lokman Hakim Idris

Kajian ini membandingkan sisa antibiotik dan racun perosak dalam sisa komersial itik Pekin dari sistem reban tertutup dan sistem reban terbuka. Sejumlah 16 itik matang diberikan diet komersial jenis yang sama dengan 8 dari setiap sistem penternakan yang berbeza dipilih untuk kajian ini. Eksperimen sisa antibiotik dan sisa racun perosak telah dijalankan menggunakan kaedah ujian enam plat, kaedah ELISA dan kaedah QuEChERS. Kaedah ujian enam plat digunakan untuk pemeriksaan

pengesanan kualitatif sekumpulan antibiotik dalam tisu haiwan; macrolides, aminoglycosides, tetracyclines, sulfonamides, B-Laktam dan quinolones menunjukkan keputusan negatif (<2mm atau tiada zon anulus di sekeliling cakera tisu) Sementara itu, kaedah ELISA digunakan untuk dadah terlarang; Chloramphenicol, Nitrofurantoin, Beta-agonist menunjukkan negatif untuk semua sampel. Kaedah QuEChERS menggunakan GC-ECD / GC-MS untuk residu racun perosak; juga menunjukkan hasil yang negatif. Oleh itu, kaedah penternakan yang berbeza tidak menyumbang kepada penggunaan antibiotik yang tidak diperlukan; hal ini juga sama bagi itik yang ditenak di reban terbuka yang terdedah kepada sisa racun perosak.

Kata kunci: *Itik Pekin, Sistem reban tertutup, Sistem reban terbuka, Antibiotik, Racun Perosak.*

1.0 INTRODUCTION

1.1 Study background

Poultry sector is an integral part of the livestock industry in Malaysia. There were 9 meat duck breeding companies with a total of 20 farms in operation in Peninsular Malaysia in 2012. The breeds used were Cherry Valley, Pekin and Muscovy. The subject of this study is Pekin duck (*Anas platyrhynchos domestica*) and used primarily for egg and meat production. The interest for this study is due to the presumption that in an open house free range system, the duck was more prone to disease due to contact with other wild birds and free access to the contaminated ponds. The farm chosen for this study has two rearing method which is open house free range system and closed house system. The open house free range system and closed house system has up to 10000 ducks populations. Majority of the duck production were exported to the Singapore and the company will be exporting to the Japan in the near future after they stopped exporting since 2007 due to Avian Influenza outbreak in Malaysia. Small number of cases of drugs and medications in excess of set MRLs detected as the poultry industry in Malaysia in a transitional state. Thus, this study will address this issues as well as the presence of pesticides residue due to free access to the ex-mining pond. The use of antibiotics to bring about improved performance in growth and feed efficiency, to synchronize or control of reproductive cycle and breeding performance also often lead to harmful residual effects (Nisha, 2008). On another hand, organochlorine pesticides accumulate in the environment. Organochlorine are very persistent and move long

distances in surface runoff or groundwater. This pesticide may end up in the ponds and affect the animal population within the area.

1.2 Justifications

- i. The production of duck is for exportation to Singapore and Japan. Thus, it is important for us to closely monitor the quality of our product.
- ii. Limited studies done on ducks in Malaysia especially on the antibiotics and pesticides residue.
- iii. Antibiotic and pesticide residue was a threat to human health as well as to animal, and can disturb the duck productivity.

1.3 Study Objectives

- i. To measure the contents of pesticides and antibiotics residue in duck meat
- ii. To compare the food safety in duck meat reared in closed house system and open house free range system

1.4 Hypothesis

- i. There will be higher antibiotic and pesticide residue presence in duck meat reared in open house free range system compared to duck meat reared in closed house system

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