



UNIVERSITI PUTRA MALAYSIA

***CHANGES OF INTESTINAL MORPHOLOGY IN SEMI -
COMMERCIAL VILLAGE CHICKEN TREATED WITH EFFECTIVE
MICROORGANISMS***

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CERTIFICATION

It is hereby certified that I have read this project paper entitled “Changes of intestinal morphology in semi - commercial village chicken treated with effective microorganisms”, by Siti Nur Fauziah binti Zainal Aabidin 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 – Final Year Project.

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DEDICATION

I dedicated this thesis to the biggest characters in my life, my parents

(Zainal Aabidin Bin Abu & Kasma Binti Saad),

My Siblings

(Muhammad Al-Fairuz & Siti Nur Fatimah),

My beloved friends,

And to all my lecturers who have endlessly supported me throughout this journey.

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LIST OF ABBREVIATIONS

>	More than
<	Less than
%	Percentage
°C	Degree Celcius
µm	Micrometer
X	Time
DPX	Distyrene Plasticizer Xylene

ABSTRAK

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

KESAN MIKROORGANISMA EFEKTIF TERHADAP PERUBAHAN KE ATAS MORFOLOGI USUS AYAM KAMPUNG SEPARA KOMERSIAL

Oleh

Siti Nur Fauziah Binti Zainal Aabidin

2017

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Penyelia Bersama: Associate Professor Dr Mohd Hezmee Mohd Noor

Mikroorganisma efektif telah terbukti mempunyai kesan yang baik dalam mencegah jangkitan, mengekalkan keseimbangan mikrob usus, meningkatkan pencernaan dan penyerapan sekali gus meningkatkan pengeluaran. Walaubagaimanapun, kurang kajian mengenai kesan mikroorganisma efektif ke atas perubahan morfologi usus ayam kampung separa komersial. Satu eksperimen telah dijalankan untuk menentukan kesan mikroorganisma efektif ke atas panjang keseluruhan usus kecil dan kesannya ke atas

perubahan morfologi usus ayam kampung separa komersial. Enam belas ekor ayam kampung jantan separa komersial telah dipilih dalam eksperimen ini. Ayam-ayam tersebut dibahagikan kepada dua kumpulan, iaitu kumpulan kawalan dan kumpulan rawatan. Kumpulan rawatan telah dibekalkan mikroorganisma efektif melalui minuman sepanjang tempoh eksperimen. Kumpulan rawatan telah menunjukkan perbezaan yang ketara ($P < 0.05$) dari segi lebar vilus dari bahagian ileum berbanding kumpulan terkawal. Tiada perbezaan ketara ($P > 0.05$) dapat dilihat di antara kedua-dua kumpulan dari segi tinggi dan lebar vilus dari bahagian duodenum dan jejunum. Selain itu, terdapat perbezaan ketara ($P < 0.05$) di dalam kumpulan rawatan di mana panjang keseluruhan usus kecil telah bertambah dengan penggunaan mikroorganisma efektif berbanding kumpulan terkawal. Kesimpulannya, mikroorganisma efektif berkesan dalam meningkatkan lebar vilus dalam usus kecil dan menyebabkan usus kecil menjadi lebih panjang.

Kata kunci: Efektif mikroorganisma, usus kecil, tinggi vilus, lebar vilus

ABSTRACT

Abstract of the project paper presented to the Faculty of Veterinary Medicine in partial requirement for the course VPD4999 – Final Year Project

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Effective microorganisms have been proved to have beneficial effect in preventing infections, maintain intestinal microbial balance, improving digestion and absorption rate thus improving production. However, lack of study has been done on morphological changes of intestine caused by effective microorganisms. An experiment was conducted to determine the effects of supplementing diets with effective microorganisms on gross anatomy of the small intestine and intestinal morphological changes of semi-commercial village chickens. Sixteen male semi-commercial village chickens were assigned into two treatment groups, the control and treated group. A

complete randomized design was used. The treated group was supplemented with effective microorganisms (EM-1) in drinking water throughout the experiment. Effective microorganism supplementation shows significantly difference of ($P < 0.05$) the width of villi of the ileum. However, no changes in the height of villi ($P > 0.05$) seen in the villi of ileum. Effective microorganism did not affect ($P > 0.05$) the height and the width of the villi of the duodenum and jejunum. Besides, gross measurement of the small intestine of semi-commercial village chickens supplemented with effective microorganisms is significantly longer ($P < 0.05$) compared to the control group. It is concluded that effective microorganism supplementation to the drinking water of sixteen semi-commercial village chicken increases the width of the villi in the ileum and causes longer small intestine.

Keywords: Effective microorganisms, small intestine, villi height, villi width.

1.0 INTRODUCTION

Malaysia has attained self-sufficiency level in poultry production since 1984 (Loh, n.d.) and now poultry has become the second staple food after rice. Malaysia is one of the countries with the highest poultry consumption with per-capita consumption of 35.3 kg in 2011 (MoA, 2011).

According to Food and Agriculture Organization (FAO), since 1986, Malaysian preferences has been shifted to village chicken meat and eggs. People started to realize the danger of antibiotic residue in poultry meat and opted for village chicken product. At that point of time, village chicken meat and egg production was estimated around 150 million eggs and 17000toneof meat which accounted for five percent of total egg production and seven percent of total poultry meat. In 1994, standing population of village chicken was estimated to be 3% of the total standing population while the other 97% are the commercial broilers. Due to continuous increase in village chicken demand, a few small-scale village chicken farming has evolved into large scale commercial village chicken farm.

Ramlah and Shukor (1987) in their study found out that majority of the farmer practiced free-range system where the village chickens are let to scavenge for food and housing provided at night. It is quite rare to find farmers that practiced semi-intensive or intensive system in Malaysia. Ahlers et al. (2009), in their book mentioned that village chickens are known to be more adapted to harsh environment with poor husbandry care compared to commercial broiler. Their immunity has always been challenged and as the

result of that, they are more resistant towards disease. Their meat has little fat, pleasant flavor with tougher texture compared to commercial chicken which have more fat, less flavor and softer texture of meat (Lokman, Goh, Sazili, Noordin & Zuki (2015). Despite all the good features of village chicken, the downside of rearing village chicken is that they have slow growth, variable body conformation and physical characteristics, also low productivity might be because they are let to scavenge food that is poor in nutrition content (Aini, 1990). Furthermore, as they are reared in free range system, their droppings are everywhere and this will attract pest as flies which can act as vector of diseases for both animal and human.

One of the ways to improve the productivity of the poultry is by reducing mortality rate, improving the feed efficiency, growth rate and production level. Therefore, antibiotic has been used in poultry industry as it has all the ability to increase the production efficiency. However, the downside of antibiotic usage was the presence of its residue in the poultry meat which has brought major concerns to the public health. Other than antibiotic, protein has been used as a tool to increase the growth rate of poultry. Therefore, by increasing protein composition in feed, the farmer will be able to reach market weight earlier. However, as the time flies, protein sources have become very expensive.

Later, the use of effective microbes has become popular as it has the same ability to improve the production efficiency as the antibiotic at the same time it guaranteed the food safety for the consumer. Effective microbe is created over 30 years ago by Dr.

Teruo Higa, a Professor of Horticulture from University of Ryukyus in Okinawa, Japan.

According to

Higa, it is prepared in the form of concentrated liquid which contains beneficial microorganisms includes lactic acid bacteria, yeast and phototrophic bacteria where when applied, it will help to promote life, degrade toxic and clean the environment (Chantsawang and Watcharangu, 1999).

Based on research done by Dahal (2012), effective microorganisms play important role in assisting feed utilization and digestion of poultry which will improve the growth rate of the poultry. Besides, effective microorganisms can improve immune system of the poultry thus increase resistant towards disease and reducing mortality rates of the poultry. Furthermore, effective microorganisms also are known to be good in alleviating malodor due to its ability to rapidly decompose organic material such as feces. This feature also help in preventing pests and insects as the feces of poultry supplemented with effective microorganisms will be more dried thus it will not attract flies. A lot of research regarding effective microbes had been concerned with other topic and lack of study has been done on morphological changes of intestine caused by effective microbes.

Therefore, the objectives of this study were:

- (a) to investigate the effect of effective microbes on intestinal morphology of semi-commercial village chicken.

(b) to investigate the effect of effective microbes on gross anatomy of small intestine in semi-commercial village chicken

The hypotheses for this study are:

H^0 : There is no significant difference between intestinal morphological changes of semi-commercial village chicken that has been fed with effective microorganism from non-treated group

H^A : There is significant difference between intestinal morphological changes of semi-commercial village chicken that has been fed with effective microorganism from non-treated group

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