



UNIVERSITI PUTRA MALAYSIA

***COMPARATIVE COMPOSITION OF FECAL CONTENTS BETWEEN
BROILER DUCKS AND VILLAGE CHICKENS***

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FPV 2016 69

**COMPARATIVE COMPOSITION OF FECAL CONTENTS BETWEEN
BROILER DUCKS AND VILLAGE CHICKENS**

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A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia

In partial fulfillment of the requirement for the
DEGREE OF DOCTOR OF VETERINARY MEDICINE

Universiti Putra Malaysia,
Serdang, Selangor Darul Ehsan.

MARCH 2016

CERTIFICATION

It is hereby certified that we have read this project paper entitled “Comparative Composition of Fecal Contents between Broiler Ducks and Village Chickens

”, by Chong Chiew Foong and in our 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

The final year project thesis is dedicated to my beloved family, all the lecturers, and friends that were involved either directly or indirectly in this project.



ACKNOWLEDGEMENTS

It is with deepest appreciation and gratitude that I thank God and all those who have made this project paper a reality.

To the persons that have assisted my throughout this project, I would firstly like to thank my project supervisor, Dr Lokam Hakim Idris for the time, wisdom, expertise, and guidance that she had granted me throughout the duration of this project, and my studies at the faculty. And also advice given by Dr Hasliza Abu Hassim.

I would also like to thank the post-graduate students and staff of the Nutrition Lab, UPM which includes En. Hasif for always lending me a helping hand when I needed it, and sharing good company.

A special thank you to all my classmates of DVM 2015 who assisted my directly or indirectly in this project.

Last but not least, my most heartfelt gratitude to my family; my grandmother, father, mother, brother and dear sister for their love and support.

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ABSTRAK

Abstrak daripada kertas projek yang dimukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada kursus VPD 4999- projek ilmiah tahun akhir

Perbandingan Komposisi Najis antara Itik Pedaging dan Ayam Kampung

Oleh

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2016

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Komposisi najis dan makanan antara itik pedaging (Cherry Valley) dan ayam kampung yang dibela di Perak Duck Food Sdn Bhd dan ladang penternakan ayam kampung berskala kecil dikaji. Jumlah keseluruhan 25 gram najis daripada itik pedaging dan ayam kampung yang matang telah diambil. Analisis proximate dijalankan untuk menganalisis kelembapan, bahan kering, abu, dan protein dalam sampel najis dan makanan menggunakan kaedah rasmi AOAC. Analisis statistic dijalankan dengan menggunakan data yang didapat dengan software statistic SPSS. Keputusan dari proximate analisis makanan menunjukkan ada perbezaan yang signifikan($P < 0.05$) dalam peratus

kelembapan iaitu $9.8 \pm 0\%$ dalam makanan hancur ayam pedaging starter bercampuran biji jagung dan $9.16 \pm 0.03\%$ dalam makanan finisher pellet itik pedaging. Keputusan dari proximate analisis makanan menunjukkan tiada perbezaan yang signifikan ($P > 0.05$) dalam peratus bahan kering, abu, dan protein antara makanan hancur ayam pedaging starter bercampuran biji jagung dan makanan finisher pelet itik pedaging. Bahan kering ialah $90.2 \pm 0\%$ dan $90.8 \pm 0\%$, abu ialah $90.2 \pm 0\%$ dan $90.8 \pm 0\%$ dan protein ialah $21.73 \pm 0.81\%$ dan $19.92 \pm 1.22\%$ masing masing dalam makanan hancur ayam pedaging starter bercampuran biji jagung dan makanan finisher pelet itik pedaging. Keputusan dari proximate analisis najis menunjukkan ada perbezaan yang signifikan ($P < 0.05$) dalam peratus abu iaitu $1.06 \pm 0.12\%$ daripada najis ayam kampung dan $3.133 \pm 0.49\%$ daripada najis itik pedaging. Keputusan dari proximate analisis makanan menunjukkan tiada perbezaan yang signifikan ($P > 0.05$) dalam peratus kelembapan, bahan kering, dan protein. Kelembapan ialah $75.56 \pm 1.31\%$ dan $72.4 \pm 1.91\%$, bahan kering ialah $24.43 \pm 1.13\%$ dan $27.6 \pm 1.91\%$ protein ialah $7.47 \pm 0.37\%$ dan $8.6 \pm 0.99\%$ dalam najis ayam kampung dan najis itik pedaging masing – masing.. Keputusan dari proximate analisis penghadaman makanan menunjukkan tiada perbezaan yang signifikan ($P > 0.05$) dalam peratus penghadaman bahan kering dan protein. Peratus penghadaman bahan kering ialah $72.91 \pm 1.25\%$ dan $69.6 \pm 2.1\%$, peratus penghadaman protein ialah $65.64 \pm 0.39\%$ dan $56.77 \pm 4.37\%$ daripada ayam kampung dan itik pedaging masing-masing.

Kata kunci : Itik Cherry Valley , ayam kampung, analisis proximate, penghadaman

ABSTRACT

Abstract of project paper presented to the Faculty of Veterinary Medicine in partial for the course VPD 4999- final year project

Comparative Composition of Fecal Contents between Broiler Ducks and Village

Chickens

By

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2016

Supervisor : Dr. Lokman Hakim Idris

Compositions of fecal contents and feed between broiler ducks (Cherry Valley) and village chickens reared at the Perak Duck Food Sdn. Bhd and a small scale village chicken farm were investigated. A total of 25 grams of fecal sample of adult broiler ducks and village chickens were collected respectively. Proximate analysis was carried out to analyze the moisture, dry matter, ash and crude protein using Kjeldahl method contents in the fecal and feed samples using official method of AOAC. Statistical analysis was performed using the data collected by SPSS statistical software. Result from the proximate analysis of feed reveals there is statistically significance ($P < 0.05$) different for the percentage of moisture contents. The moisture content in chicken broiler starter crumble mixed with corn is $9.8 \pm 0\%$ while in duck broiler finisher pellet is

9.16±0.03% but there is no statistically significance ($P>0.05$) different in percentage of dry matter, ash and crude protein content between chicken broiler starter crumble mixed with corn and duck broiler finisher pellet. The dry matter is 90.2±0% and 90.8±0%, ash is 4.43±0.63% and 5.23±0.83% and crude protein is 21.73±0.81% and 19.92±1.22% in chicken broiler starter crumble mixed with corn and duck broiler finisher pellet respectively. The results for the proximate analysis of fecal samples is that there is statistically significance ($P<0.05$) different for the percentage of ash contents which is 1.06±0.12% in village chicken feces and 3.133±0.49% in Cherry Valley duck feces but there is no statistically significance ($P>0.05$) different in percentage of moisture, dry matter, ash and crude protein content between feces of village chicken and Cherry Valley. The moisture is 75.56±1.31% and 72.4±1.91% , the dry matter is 24.43±1.13% and 27.6±1.91% while the crude protein is 7.47±0.37% and 8.6±0.99% respectively in feces of village chicken and Cherry Valley ducks. The results for the digestibility of feed is that there is no statistically significance ($P>0.05$) different in digestibility of dry matter and crude protein content between village chicken and Cherry Valley duck. The digestibility of dry matter is 72.91±1.25% and 69.6±2.1%, the digestibility of crude protein is 65.64±0.39% and 56.77±4.37% in village chicken and Cherry Valley ducks respectively.

Keywords : Cherry Valley ducks, village chickens, proximate analysis, digestibility

1.0 INTRODUCTION

1.1 Study Background

Most of the meat and eggs being consumed is produced by the chicken, only part of them are from ducks and geese as well as exotic birds. The nutritional value in products from ducks can enhance the nutritional standard in human food. (Heinz Pingel, 2004). Due to lack of duck farmers, limited development of duck meat products and little promotion of duck meat has led to limited consumption among the consumers (Aronal *et al.*, 2012). Being the 14th producer of duck meat in the world shows that duck industry can be an important business in Malaysia (FAO, 2011). The increase in production of duck for local consumption and exportation has been encouraged by the current agricultural policies set by the Malaysia government (Adzitey *et al.*, 2012). At present, the management system of duck being practiced by Malaysia mostly are still open housed free range system with sand litter but there are some large scale company practicing closed housed system with slatted floor. There are some countries like Japan, South Korea, Malaysia and Philippines are still practicing rice-duck farming system (Choi *et al.*, 1996).

The village chicken in Malaysia is called as “Ayam Kampung” (village chicken) in Bahasa Malaysia which is the result of crossbreeding of the Red Jungle Fowl with mixed exotic domestic breeds brought by the Europeans, mainly the British (Azahan and Zahari, 1983). Just like a lot other tropical countries, the village chicken or *Gallus domesticus* is kept by over three-quarters of semi-rural and rural households in Malaysia

as small backyard flocks. The chickens are being kept free range in the daytime and housed at night or integrated farming system with sand litter (Aini, 1990).

Animals fed with commercial formulated diets consume considerable amount of protein and other nitrogen-containing substances in their diets. The conversion of dietary nitrogen to animal products is relatively inefficient; 50 to 80 percent of the nitrogen is excreted (Arogo et al., 2001). Nitrogen is excreted in both organic and inorganic compounds. Nitrogen emissions from manure take four main forms: ammonia, dinitrogen, nitrous oxide and nitrate. Ducks and chickens had same proventriculus weights and lengths and weights of caeca and colon. However, the ducks had 22%, 27%, 30%, 37% and 60% greater mass specific small intestinal weights and lengths, and liver, gizzard and pancreas weights, respectively, than chickens. In the wild, ducks generally prefer eating water plants, which commonly have higher water contents, such as duckweed, azolla and algae, but have high digestible dry matter (Leng and Bell, 1995). SO it is reasonable to assume that ducks would develop larger small intestines, allow more rapid passage of digesta and efficient absorption. However, the greater caeca and colon volume of chickens would increase the digestive capacity with respect to diets high in fibre compared with ducks. In addition the caeca in chickens contain higher concentration of bacteria (Barnes *et al.*, 1972) and therefore play an important role in the microbial degradation of some carbohydrates (Jorgensen *et al.*, 1996), synthesis of vitamins (Coates *et al.*, 1968) and degradation of nitrogenous compounds (Goldstein, 1989).

Poultry manure is an excellent fertilizer material as it contains high nutrient content, especially for nitrogen(N), phosphorus(P), and potassium(K). these nutrients plus others come largely from bird feces. Manures decompose (mineralize) in the soil releasing nutrients for crop uptake. If poultry litter is readily available locally, it can help reduce fertilizer cost in vegetable production(George H. *et al.*, 2009).

The aim of this study is to compare the composition of fecal contents like moisture, dry matter, ash and crude protein in village chickens and Cherry Valley ducks and also to determine the digestibility of village chickens and Cherry Valley ducks as well as to identify which feces is better to be used as manure fertilizer.

1.2 Justification

- i) This project allowed us to access the digestibility of feed and the left over nutrients in the broiler ducks and the village chickens feces which are managed extensively with sand litter.
- ii) Data on the composition of feces in the broiler ducks and village chickens allowed more efficient use of the manure as fertilizer in crop production.

1.3 Study objectives:

- i) To determine the digestibility of feed of broiler ducks and village chickens.
- ii) To identify which feces is better to be used as fertilizer between feces of broiler ducks and village chickens.

1.4 Hypothesis

Broiler ducks have lower digestibility and will be a better source of fertilizer as compared to feces of village chickens.

1.0 LITERATURE REVIEW

2.1 Poultry manure as fertilizer

Poultry manures have been used as natural crop fertilizers for centuries. It has been long recognized as one of the most desirable manures due to its high nitrogen contents. Besides fertilizing crops, manures also supply other essential plant nutrients and improve soil quality by adding organic matter, which help to improve soil's moisture and nutrient retention. Poultry manure's nutrients composition may vary depending on manure- to litter- material ratio, litter handling, and the type of bird, feed, and litter material. Fertilizer grades for manure can be calculated by comparing the total amounts of nitrogen, phosphorus, and potassium as a simple ratio. Not all nitrogen in the manure will be in the same form. Some nitrogen in poultry manure will be in the form of ammonium which is volatile, so there will be some loss of this nitrogen to the atmosphere. Environmental conditions, such as rainfall, wind, and sunlight will also affect the availability of organic nitrogen, phosphorus, and potassium(Michael ,1992)

2.2 Protein and amino acid requirements of ducks

determined more precisely. And lastly to include factors like age of the animals and type of feed as they play important role in determining the fecal compositions.

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