



UNIVERSITI PUTRA MALAYSIA

**DETERMINATION OF DISTINCT MORPHOLOGICAL DIFFERENCES
BETWEEN CARCASS OF VILLAGE CHICKEN, COLOR BROILER, AND
WHITE PLUMAGE BROILER CHICKEN**

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By

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CERTIFICATION

The project report attached here entitled “Determination of Distinct Morphological Differences Between Carcasses of Village Chicken, Color Broiler and White Plumage Broiler Chicken” is prepared by Juliana Binti Shaib and submitted to the faculty of Agriculture in fulfillment of the requirements of the course SHW4999 (Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science).

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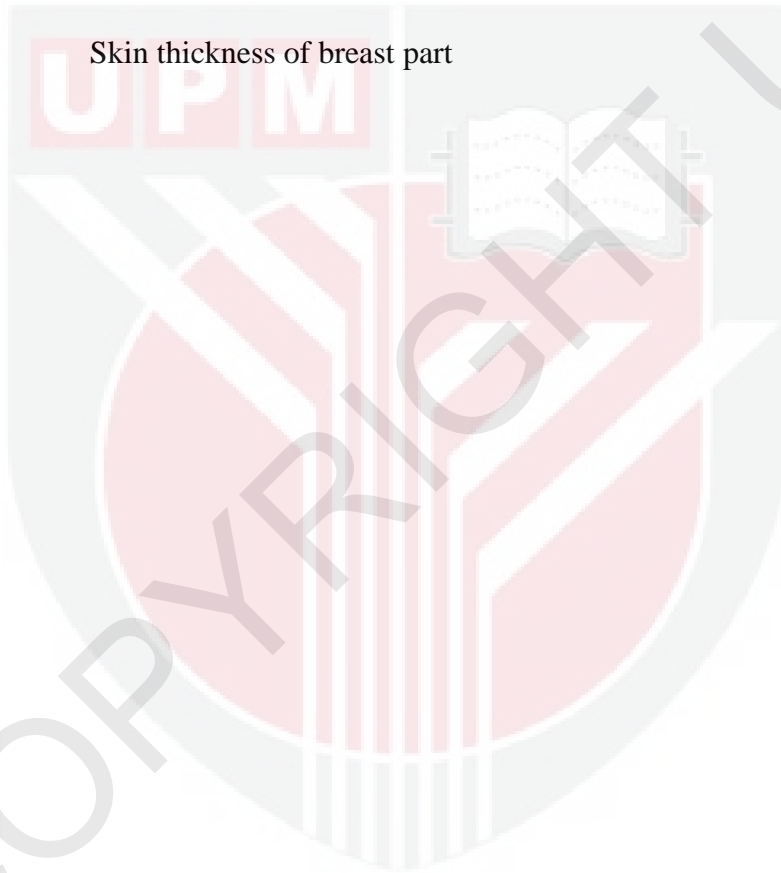
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ABSTRACT

A study was conducted to investigate the morphological differences that exist between three types of chicken which is village chicken, color broiler and broiler chicken. The specific objectives are to determine differences in breast characteristics and other body parts between three types of chicken and to determine differences in skin characteristics between three types of chicken. Three types of chicken were randomly selected from three different sources. Age of chickens were different for every types but had same body weight of 1.5kg. The height of breast bone showed there was significant different ($P < 0.05$) among three types of chicken. The depth for breast muscle showed that village chicken and color broiler was not significant difference ($P > 0.05$), but the white broiler chicken show significant different ($P < 0.05$). There were three parts to measure the skin thickness which are breast, thigh and back part. For the breast part there was no significantly different between color broiler and white broiler. The village chicken skin thickness was significant. The thigh part of the skin thickness showed that white broiler was significant different than village and color broiler. There was significantly different ($P < 0.05$) for skin thickness at the back part for all three types of the chickens. The feathers follicle for village chicken at the breast part was significant ($p < 0.05$) compare to color and broiler. At the thigh part the feathers follicle count for village and color broiler was not significant. There was significant different ($p < 0.05$) for back part of the broiler chicken to color and village chicken. This study indicates that, there are distinct morphological differences between these three types of chickens.

ABSTRAK

Kajian ini dijalankan adalah untuk megkaji perbezaan yang wujud di antara tiga jenis ayam yang berbeza iaitu ayam kampung, ayam kampung kacukan, dan ayam pedaging. Tujuan utama kajian ini adalah untuk menentukan perbezaan pada ciri-ciri dada dan juga ciri-ciri pada kulit ketiga- tiga ayam ini. Ketiga-tiga jenis ayam ini dipilih secara rawak daripada sumber yang berbeza. Setiap jenis ayam mengandungi sembilan ekor dan akan disembelih ketika berat mencapai 1.5kg. Analisis menunjukkan terdapat perbezaan ($p < 0.05$) yang ketara antara ketiga- tiga jenis ayam pada bahagian tulang dada. Dimana, ayam kampung menunjukkan purata ketinggian yang paling tinggi diikuti dengan ayam kampung kacukan dan ayam pedaging. Ketebalan daging pada bahagian dada pula menunjukkan ayam kampung dan ayam kampung kacukan tiada perbezaan ($p > 0.05$), tetapi ayam pedaging menunjukkan perbezaan ($p < 0.05$). Terdapat tiga bahagian untuk menguji ketebalan kulit ayam iaitu dibahagian dada, peha, dan belakang. Pada bahagian dada tiada perbezaan ($p > 0.05$) antara ayam kampung kacukan dan ayam pedaging tetapi terdapat perbezaan pada ayam kampung. Terdapat perbezaan ketara ($p < 0.05$) pada bahagian belakang untuk ketiga- tiga ayam. Kiraan bulu pada bahagian dada untuk ayam kampung menunjukkan perbezaan ($p < 0.05$), manakala ayam kampung kacukan dan pedaging tidak menunjukkan perbezaan yang ketara. Pada bahagian peha, kiraan bulu untuk ayam kampung dan ayam kampung kacukan adalah tiada perbezaan ($p < 0.05$). pada bahagian belakang, ayam kampung menunjukkan purata nilai yang paling tinggi tetapi tiada perbezaan ($p > 0.05$) dengan ayam kampung kacukan. Berdasarkan keputusan yang diperolehi, keempat- empat ciri ini dapat menunjukkan perbezaan untuk mengenal pasti ketiga-tiga jenis ayam ini.

CHAPTER 1

INTRODUCTION

1.1 General background

In most of the south East Asian countries, poultry has been practiced for centuries as a backyard operation using scavenging chicken among rural families (Ramlah 1999). Information on characteristics of farmed animals is essential to design livestock conservation, development and breeding programs in management of Animal Genetic Resources (AnGr) at local, national, regional and global level (FAO, 2012). Nowadays, the demand for village chicken is keep increasing, because people has already realize about the good texture and taste of the village chicken meat. The supply of village chicken is limited because of low production. Therefore, breeder farms are engaging in producing color broilers to overcome problem of this shortage. And this chicken are being referred to as crossbreed village chicken for marketing purpose. Almost all the village chicken sold in the restaurant and other markets are from color broiler chicken.

Color broiler can be marketed between 45-84 days, compared to white plumage broiler chicken is 26-35 days, native village chicken 100-140 days and UPM village chicken, 70 days. The preference to native village chicken is still very strong due to the better texture and taste. UPM village chicken was design to provide alternative for native village chicken without compromising the texture and taste of the native village chicken.

The carcass characteristics of animal depend on many factors such as species, breeds, ages, and sexes of the animal. The males are usually bigger and heavier than female

chicken (Musa et al., 2006). This differences probably arises from differences in the onset of fattening and metabolic differences (Marks, 1990).

There is no guideline or significant references to identify the types of chicken, but Hasanah (2015), did some study on the morphological difference involving the breast region of these birds and there was a significant different among these birds with the height of the keel bone in particular. Therefore, this study is necessary to determine other morphological differences that exist among the type of chicken in the market besides examining the morphology of dressed carcasses.

1.2 Research problem

- There is no guideline to differentiate the carcasses between different types of chicken.

1.3 Research hypothesis

- Carcass feather density, skin thickness, and breast bone height can differentiate the different types of chicken.

1.4 Objectives

a) General objective

- To determine the morphological differences between three types of chicken which is the white plumage broiler chicken, color broiler, and village chicken.

b) Specific objectives

- To determine the breast characteristics between three types of chicken.
- To determine the skin characteristics between three types of chicken.
- To determine characteristics of other selected body parts.

1.5 Significant of study

- The results from this study will provide information on the morphological differences that exist among the type of chicken in the market besides examining the morphology of pre-slaughter chicken. The breast, skin, feathers follicle count and body circumference characteristic will help in identifying the types of chicken.



REFERENCES

- Assan , N. (2003).** Bio prediction of body weight and carcass parameters from morphometric measurement in livestock and poultry. *Scientific J. of Review*, 2(6), 140-150
- Azhar Kasim (2007).** Ayam Kampung Dan Selesema Burung. <http://budayamalaysia.blogspot.com/>. Accessed on Januari 2011.
- Adedeji, T.A., Adebambo O.A., Peters S.O., Ojedapo L.O. and Ige A.O. (2006).** Growth performance of crossbred and purebred chickens resulting from different Sire strain in a Humid Tropical Environment. *Journal of Animal and veterinary Advances*, 5(8):674-678.
- Azharul, M.I., Ranvig, H. and Howlider, M.A.R. (2005).** Comparison of growth rate and meat yield characteristics of cockerels of Fayoumi and Sonali under village conditions in Bangladesh. *Livestock Research for Rural Development*, 17(2): 18-23.
- Charlotte, Tsui. (2007).** Structural and Material Properties of Chicken Skin Regions. Instron Tensile Testing.
- Cahaner, A., Ajuh, J.A., Siegmund-Schultze, M., Azoulay, Y., Druyan, S. and Zarate, V. (2008).** Effects of genetically reduced feather coverage in naked-neck and featherless broilers on their performance under hot conditions. *Poultry Science* 87:2517-2527

Crawford, R.D. (1990). Origin and history of poultry species. In: Crawford, R.D.

FAO (2012). Phenotypic characterization of animal genetic resources. FAO Animal Production and Health Guidelines no.11. [on line]. [accessed on 25.05.2014]. available at <http://www.fao.org/docrep/015/i268e/i268e00.pdf>

Faraque, S., Siddique, N.U., afroz, M.A and Islam, M.S (2010). Phenotypic characterization of native chicken reared under intensive management system. J. Bangladesh Agri. Univ., 8(1), 79-82.

Frischknect, C. O.; Jull, M. A. (1946): Amount of breast meat and live and dressed grades in relation to body measurement in 12-week old purebred and crossbred chicken. Poultry science 25: 330-345

Howlider, M.A.R., F. Begum., M.S. Islam., and M.A. Wahid (1995). Feathering and meat yield of full feathered and Nana Neck indigenous chicken of Bangladesh. Journal of Applied Animal Research 8:191-195.

Muthiah (1967). Mechanical properties of skin, hides and constituent fibres. Biorheology, 1967, pp.185-191

Musa H.H., Chen G.H., Cheng J.H., Li B.C., Mekki D.M. (2006). Study on carcass characteristics of chicken breeds raised under the intensive condition. International journal of poultry science 5 (6) : 530-533.

Marks, H.L. (1990). Genotype by diet interactions in body and abdominal fat weight in broilers. Poult. Sci., 69: 879-886.

Mitutoyo Digital Micrometer. <http://www.msi-viking.com/detail.asp?masterid=293->

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N.G Gregory & J.K. Robins (2010) : The scoring method will showed that grading chicken on a fiver point scale according to the protuberance of the keel and size of the breast muscle can be effective in distinguishing total fatness, proportion at fatness, and total muscularity in birds bodies

Pym R.A.E., Alders R.G. (2011). Introduction to village and backyard poultry production. In: Alternative Systems for Poultry –Health, Welfare and Productivity (Eds. Sandilands V., Hocking P.M.). Pp. 97-109