

## Pengaruh Tepung Apu apu (*Pistia stratiotes* L.) terhadap Persentase Carcass dan Protein Ayam Kampung

### *The Effect of Water Lettuce Meal on The Percentage of Carcass and Protein in Kampong Chicken*

R. Rusny<sup>1\*</sup>, MN. Hidayat<sup>1</sup>, M. Basri<sup>1</sup>, M. Masri<sup>2</sup>

<sup>1</sup>Department of Animal Husbandry, Faculty of Science and Technology, State Islamic University of Alauddin, Makassar, Indonesia, Jl. H. M. Yasin Limpo No.36 Samata Gowa, South Sulawesi 92113.

<sup>2</sup>Department of Biology, Faculty of Science and Technology, State Islamic University of Alauddin, Makassar, Indonesia, Jl. H. M. Yasin Limpo No.36 Samata Gowa, South Sulawesi 92113.

\*Email: rusny@uin-alauddin.ac.id

#### ABSTRAK

Kualitas pakan merupakan faktor utama dalam mendukung produksi ayam kampung. Tanaman apu apu (*Pistia stratiotes* L.) adalah salah satu tanaman yang mengandung unsur hara yang dibutuhkan oleh ayam kampung karena tanaman ini memiliki kandungan protein kasar yang tinggi (23,57%, berdasarkan bahan kering). Penelitian ini dilakukan untuk mengevaluasi pengaruh penambahan tepung apu apu terhadap persentase karkas dan protein daging ayam kampung. Desain eksperimen yang digunakan adalah desain acak lengkap, yang terdiri dari lima perlakuan (0, 5, 10, 15, dan 20% tepung apu apu pada ransum) dan tiga pengulangan. Setiap perlakuan terdiri dari 3 ekor ayam kampung. Hasil studi menunjukkan bahwa persentase karkas rata-rata adalah 67,51, 69,33, 69,47, 68,76, dan 70,88% sedangkan untuk kandungan protein pada daging dada adalah 25,21, 26,03, 25,43, 25,86, dan 25,35% pada 0, 5, 10, 15, dan 20% tepung apu apu. Pemberian tepung apu apu tidak berpengaruh signifikan ( $P > 0,05$ ) terhadap persentase karkas dan kadar protein daging ayam kampung.

Kata kunci: *Persentase Karkas, Ayam Kampung, Protein Daging, Pistia stratiotes, Tepung apu apu.*

#### ABSTRACT

*The quality of feed is the Main factor in supporting the production of Kampong chickens, Water lettuce meal (WLM) (*Pistia stratiotes* L.) is one of the plants that contain nutrients needed by Kampong chickens because WLM has high crude protein content (23,57%, dry matter base). This study was conducted to evaluate the effect of WLM addition to the percentage of carcass and meat protein content of Kampong chicken. The experimental design was a completely randomized design, consisting of five treatments (0, 5, 10, 15, and 20% of WLM in the ration) and three replications. Each measured unit consisted of 3 Kampong chickens. The results showed that the average carcass percentage was 67.51, 69.33, 69.47, 68.76, and 70.88% while for protein content in breast meat was 25.21, 26.03, 25.43, 25.86, and 25.35% in 0, 5, 10, 15, dan 20% of WLM, respectively. The addition of WLM did not have a significant effect ( $P > 0.05$ ) on carcass percentage and protein content of Kampong chicken meat.*

*Keywords: Carcass Percentage, Kampong chicken, Meat Protein, Pistia stratiotes, Water lettuce meal.*

## INTRODUCTION

Increased population and productivity of poultry need to be balanced with the availability of feed ingredients to be formulated into rations (Sugiharto, 2016), because the feed ingredients that contain enough nutrition to meet the needs of poultry both in terms of quality and quantity will support the growth and productivity of chicken (Sitompul *et al.*, 2016). The nutrients referred are food substances such as carbohydrates, proteins, fats, vitamins, and minerals that must be contained in feed ingredients that will be formulated into rations (Sugiharto, 2016).

The development of Kampong chickens has constraints, including low levels of production, both meat and eggs associated with the maintenance and feeding system (Astuti, 2012). Increased production of Kampong chicken can be done through improving the quality and quantity of feed with an intensive production system (Thomas *et al.*, 2014).

The main factor in supporting production in Kampong chickens is the quality of feed (Tamzil *et al.*, 2015). Even though we have the best quality of gene, the quality of the feed will also affect the growth of these animals (Astuti, 2012). A feed is food or intake consumed by livestock derived from various types of feed ingredients that has been processed or unprocessed to meet the nutritional needs of the animal (Tamzil *et al.*, 2015).

Water lettuce (*Pistia stratiotes* L.) meal (WLM) has high crude protein content (23,57%) (Erwan, 2020). The aquatic plant is relatively easy to find in water areas such as lakes, ponds, and rice fields and others water bodies (Sutama, 2005).

Present study was conducted to evaluate the effect of WLM in the ration to the percentage of carcass and meat protein of Kampong chicken.

## MATERIALS AND METHODS

### Experimental Design and Animals

The design applied in this study was Completely randomized Design (CRD) consisting of five treatments and three replications. The treatment was five levels of WLM in the ration (0, 5, 10, 15, and 20%) and fed to chickens during 30 days. Each experimental unit consisted of three Kampong chickens (Unsexing, 3 months old) which randomly selected and then placed into a wooden cage.

### Cage

Before the experimental period, the cage (60 x 60 cm) was sanitized with disinfectant while rice husk was used as litter (7 cm of thickness). The light in the barn was maintained with 2 light bulbs.

### Preparation of WLM

Water lettuce used in this study was taken in Bantaeng regency, South Sulawesi Indonesia. The plant was sun dried and then milled before mixing in the ration

### Ration Formulation

Table 1. Nutrient content of Water Lettuce Meal

Nutrient content	% as fed
Water	16.94
Crude Protein	35.74
Crude Fat	7.67
Crude fiber	15.87
Nitrogen free extract	16.65
Ash	24.07

Table 2. The ingredients of the ration with 5 levels of Water Lettuce Meal (WLM)

Feed Ingredients	(% WLM)				
	0	5	10	15	20
Corn	54	53	53	53	53
Rice bran	10	9	8	7	6
Fish flour	10	9	7	5	3
Soybean meal	26	24	22	20	18
WLM	0	5	10	15	20

Table 3. Nutritional content of the ration with 5 levels of Water Lettuce Meal (WLM)

Nutritional Content	(% WLM)				
	0	5	10	15	20
Protein (%)	16.20	16.11	16.12	16.30	16.30
Energy Metabolism (Kcal/Kg)	2821.50	2808.71	2808.03	2807.35	2806.67
Crude fat (%)	4.12	4.29	4.46	4.63	4.80
Crude fiber (%)	3.94	4.47	5.01	5.55	6.09

### Observed parameters

The measured parameters in this study were the percentage of carcass and carcass protein. Carcass percentage was calculated based on Bundy (1960): Percentage of carcass (%) = (Carcas weight (g) / live chicken weight (g)) x 100%. The determination of protein content of meat (breast) was analyzed using the Kjeldahl method (AOAC, 1990).

### Data Analysis

The data obtained was analyzed with the following model:

$$Y = \mu + \alpha + \epsilon$$

where y is the dependent variable,  $\mu$  is the overall mean,  $\alpha$  is effect of treatment and  $\epsilon$  is error.

## RESULTS AND DISCUSSION

The results of the application of WLM in the ration to the percentage of carcasses and meat protein of Kampong chicken are presented in Table 4. The results of variance in the percentage of carcass and meat protein values were shown in table 4 shows that the application of WLM flour had no significant effect ( $p > 0.05$ ) on the percentage of carcass and meat protein content of Kampong chicken.

Table 4. The average percentage of carcass and meat protein content of Kampong chicken

Parameter	Treatment					p-value
	P0	P1	P2	P3	P4	
Percentage of the carcass (%)	67.51	69.33	69.47	68.76	70.89	0.17
Meat protein (%)	25.22	26.04	25.43	25.87	25.36	0.96

### Percentage of carcass

The results of this carcass percentage study were higher compared to studies Iskandar (Iskandar, 2005) which stated that the percentage of carcasses calculated based on body weight without feathers and without viscera compared with the average live weight of the two strains of chickens ranged 62.89% each for Kampong chickens and 64.93% for Cross-pelung chickens, while Indra (2015) reported that the age of Kampong chickens aged 12 weeks was around 53.04%. This is supported by the opinion of Iskandar, stating that carcass weight is influenced by the type of chicken, ration, body weight, sex, and age.

Situmeang (2014) stated that the average slaughter weight and percentage of Kampong chicken carcass are 537.63 g/head and 62.96%, respectively. Meanwhile, according to Kurniawan (2011), the percentage of Kampong chicken at 12 weeks is 66.49% - 69.35%. According to Massolo (2017) reported that, on average, the percentage of carcasses obtained ranged from 66.37% - 73.29%. This is in line with North (1984) that the percentage of broiler carcasses varies between 65 - 75% of body weight, the heavier the chicken the higher the carcass.

The amount of protein content in the ration is one of the elements needed for tissue growth. The amount of protein in the ration will affect the growth of body weight, as is the case

by Soeparno (1994), one of the most influential food substances in the growth of carcass forming tissue is protein. This is supported by Rasyaf (2006) which stated that chicken body weight is influenced by the quantity and quality of consumed feed, so that differences in food feed ingredients and the amount of feed consumed will have an impact on the gain due to the content of food substances which needed for optimal growth.

Resnawati (2004) stated that the carcass weight produced influenced by several factors such as age, sex, weight, size and conformation of the body, fat, quality, and quantity of rations as well as the animal strain. Carcass weight is also influenced by body weight, where a large body weight will be followed by a large carcass weight and vice versa.

### Meat Protein Content

The meat protein content of Kampong chickens fed with additional WLM maintained for 30 days are shown in Table 4 with the highest value of protein content (26.04%) found in the % of WLM while the lowest (25.22%) was found in the 0% of WLM.

The results are higher when compared with Hartati & Dewi (2013) that free-range chicken fed with 100% broiler feed had average protein content of around 19.38%. Lawrie (2003) also reported the protein content ranged from 16% to 22%, the chemical content of meat from livestock also varied greatly depending on

age, strain, species, stress, feed, and sex. This is also supported by Aberle, (2001) and Soeparno (1994), who report that chicken meat contains essential amino acids, namely valine, tryptophan, threonine, methionine, leucine, isoleucine, lysine, and histidine.

Susanti (1991) stated that the crude protein content (23.05%) of free range chicken were greater than the purebred chicken protein content (21.86%). This is in line with research conducted by Winedar (2006) with a range of broiler chicken protein values between 21.80% to 23.20%. Feeds with low protein content will be also has a low meat protein content (Kartikasari, 2001). This research proved that the use of WLM in feed can substitute the use of high protein feed such as soybean meal and fish meal.

## CONCLUSION

The conclusion in this study is that the addition of WLM at different levels in the ration did not have a significant effect on the percentage of carcass and meat protein content.

## DAFTAR PUSTAKA

- Aberle, E, D., C, J, Forest, H, B, Hedrick, M, D, Judge dan R,A, M. 2001. *The Principle of Meat Science*, W,H, Freeman and Co. San Fransisco.
- AOAC. 1990. *Official Methods of Analysis*. 15th Edn. Association of Official Analytical Chemists. Washington DC.
- Astuti, N. 2012. Kinerja Ayam Kampung Dengan Ransum Berbasis Konsentrat Broiler. *Jurnal AgriSains*, 4(5), 51–58.
- Bundy, C.E, & R. V. D. 1990. *Poultry Production*. Prentice Hall Inc. New York.
- Erwan, E. 2020. Pemanfaatan Tepung Daun Apu-Apu (*Pistia Stratiotes*) dalam Ransum Basal Terhadap Organ Pencernaan Ayam Ras Pedaging. *Jurnal Peternakan*, 17(1), 17. <https://doi.org/10.24014/jupet.v17i1.7439>
- Hartati, S., & Dewi, C. 2013. Kualitas kimia Daging Ayam Kampung dengan Ransum Berbasis Konsentrat Broiler. *Jurnal AgriSains*, 4(6). <http://ejurnal.mercubuana-yogya.ac.id/index.php/Agrisains/article/view/64>
- Hidayat, C., S, I., & Sartika, T. 2011. Respon Kinerja Perteluran Ayam Kampung Unggul Balitnak (Kub) Terhadap Perlakuan Protein Ransum Pada Masa Pertumbuhan. *Jitv*, 16(2), 83–89.
- Indra, W. 2015. Slaughter Weights, Carcass And Income Over Feed Cost Males Sentul Chicken At Different Slaughter Age. *Students E-Journal*, 4(3). <http://jurnal.unpad.ac.id/ejournal/article/view/6944/3259>
- Iskandar. 2005. Pertumbuhan dan Perkembangan Karkas Ayam Silangan Kedu x Arab pada Dua Sistem Pemberian Ransum. *Jurnal Ilmu Ternak Dan Veteriner*, 10(4), 253–259.
- Kartikasari, L. 2001. Komposisi Kimia dan Studi Asam Lemak Daging Dada Ayam Broiler yang Mendapat Suplementasi Metionin pada Pakan Berkadar Protein Rendah. *Buletin Peternakan*, 25(1), 33–39. <https://journal.ugm.ac.id/index.php/buletinpeternakan/article/viewFile/1427/1226>
- Kurniawan, H. 2011. Karkas dan Potongan Karkas Ayam Kampung Umur 10 Minggu yang Diberi Ransum Mengandung Bungkil Biji Jarak Pagar (*Jatropha curcas L*) Terfermentasi *Rhizopus oligosporus* [Skripsi].
- Lawrie. 2003. *Ilmu Daging*. Edisi Ke-5.

Universitas Indonesia - Google Scholar.

- Massolo, R., Mujnisa, A., & Agustina, L.** 2017. Persentase Karkas dan Lemak Abdominal Broiler Yang Diberi Prebiotik Inulin Umbi Bunga Dahlia. In *Buletin Nutrisi dan Makanan Ternak* (Vol. 12, Issue 2). <http://journal.unhas.ac.id/index.php/bnmt/article/view/1314>
- North, M. O.** 1984. *Commercial chicken production manual*. Commercial Chicken Production Manual.; AVI publishing Co. Ltd.
- Rasyaf, M.** 2006. *Beternak Ayam Kampung*. Penebar Swadaya: Jakarta.
- Resnawati, H.** 2004. *Bobot Potongan Karkas Dan Lemak Abdomen*. Pros. Seminar Nasional Teknologi Peternakan dan Veteriner. Pusat Penelitian dan Pengembangan Peternakan. Bogor, 2004- Google Scholar.
- Sitompul, S. A., Sjoefjan, O., & Djunaidi, I. H.** 2016. Pengaruh Beberapa Jenis Pakan Komersial terhadap Kinerja Produksi Kuantitatif dan Kualitatif Ayam Pedaging. *Buletin Peternakan*, 40(3), 187. <https://doi.org/10.21059/buletinpeternak.v40i3.11622>
- Situmeang, E. C.** 2014. *Persentase karkas ayam kampung hasil penambahan zeolit dalam ransum*. Skripsi Sarjana. Fakultas Peternakan. Institut Pertanian Bogor. Bogor.
- Soeparno.** 1994. *Ilmu dan Teknologi Daging*. Gadjah Mada, University Press: Yogyakarta.
- Steel.** 1991. *Prinsip Dan Prosedur Statistika Suatu Pendekatan Biometrik*. PT. Gramedia. Jakarta.
- Sugiharto, S.** 2016. Role of nutraceuticals in gut health and growth performance of poultry. In *Journal of the Saudi Society of Agricultural Sciences* (Vol. 15, Issue 2, pp. 99–111). King Saud University. <https://doi.org/10.1016/j.jssas.2014.06.001>
- Susanti, S.** 1991. *Perbedaan Karakteristik FisikoKimiawi dan Histologi Daging Sapi dan Daging Ayam*. Institut Pertanian Bogor.
- Sutama, I.** 2005. Pengaruh Suplementasi Kapu - Kapu (*Pistia stratiotes* L) Dalam Ransum Terhadap Kolesterol Pada Serum Dan Daging Ayam Kampung. *Majalah Ilmiah Peternakan*, 8(2). <https://ojs.unud.ac.id/index.php/mip/article/view/1682/996>
- Tamzil, M. H., Ichsan, M., Jaya, N. S., & Taquiuddin, M.** 2015. Growth rate, carcass weight and percentage weight of carcass parts of laying type cockerels, Kampung chicken and Arabic chicken in different ages. *Pakistan Journal of Nutrition*, 14(7), 377–382. <https://doi.org/10.3923/pjn.2015.377.382>
- Thomas, B., Togarepi, C., & Simasiku, A.** 2014. *International Journal of Livestock Production Analysis of the determinants of the sustainability of cattle marketing systems in Zambezi Region of north-eastern communal area of Namibia*. 5(7), 129–136. <https://doi.org/10.5897/IJLP2013.0190>
- Winedar., Hanifiassi., S. L. D. S.** 2004. *Daya Cerna Protein Pakan, Kandungan Protein Daging Dan Pertambahan Berat Badan Ayam Broiler Setelah Pemberian Pakan Yang Difermentasi Dengan Effective Microorganisme-4 (Em-4)*. Bioteknologi, MIPA UNS, ISSN: 0216-6887.