Carcass percentage of male KUB-2 KK chicken on different body weight

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Abstract. KUB2 KK chicken is an improved KUB1 chicken, the improved local chicken created by the Indonesian Research Institute for Animal Production (IRIAP). Carcass percentage is an important indicator to evaluate the productivity of the slaughtered chicken. The objective of this research was to evaluate the carcass percentage of male KUB2 KK chicken on different body weights. 94 heads of ten weeks old male KUB2 KK chicken were used and it was divided into six bodyweight groups (G1: 700 to 799 g, G2: 800 to 899 g, G3: 900 to 999 g, G4: 1,000 to 1,099 g, G5: 1,100 to 1,199 g and G6: 1,200 to 1,299 g). Resulted data were analyzed using one-way ANOVA. The results showed carcass percentage of G1, G2, G3, G4, G5 and G6 were 61.12 %, 61.62 %, 62.50 %, 63.47 %, 63.72 %, and 64.10 %, respectively. The group of body weight resulted significantly different on carcass percentage. Carcass percentage increased with increasing body weight. Thighs were the biggest part of the carcass. It was followed by breast, back, and wings. Abdominal fat had a tendency to increase by an increasing of body weight.

1. Introduction
In recent years, the demand for local chicken products, especially meat, is increasing. The trend could be remaining increase by increasing of population and purchasing power of Indonesian citizens. Hence, local chicken breeds with high productivity are strongly needed. Genetic improvement of local chicken can be done by selection and crossbreeding or a combination of both selection and crossbreeding [1]. Crossbreeding may result in quick improvement but selection gives more permanent improvement [1]. KUB-2 KK (Kampung Unggul Balitbangtan-2 Kaki Kuning) chicken is an improved local chicken resulted from the improvement of KUB-1 chicken through selection [2]. KUB-1 chicken is an improved local chicken that is selected for egg production [3,4] and has been launched by the Indonesian Minister of Agribusiness with decree number 274/Kpts/SR.120/2/2014 [5]. While KUB-2 KK chicken is KUB-1 chicken which is selected for both yellow shank and egg production traits [2] and has not been launched yet. It has two subgroups i.e. chicken with and without yellow shanks [2]. The selection program induced the productivity of KUB-2 KK better than KUB-1 [2]. Egg production is one of the important traits for farmers [6].

Currently, in the breeding process, many traditional KUB-1 chicken breeders do not separate males and females in the initial age or day-old chicken (DOC). Therefore, there is an excess of male chickens in their flock. These male chickens are usually sold at 10 weeks old as chicken for producing meat. It may also occur in KUB-2 KK chicken breeders after they raise this improved local chicken. To measure the productivity of slaughter chickens, the percentage of the carcass is an important indicator. However,
the information on the carcass percentage of male KUB-2 KK chicken has not been available yet. Therefore, the objective of this study was to observe the carcass percentage of male KUB-2 KK chicken on different body weights at 10 weeks old age.

2. Method
This study was conducted in the Indonesian Research Institute for Animal Production (IRIAP), Ciawi-Bogor, West Java Province, Indonesia. The study used 94 of ten weeks old male KUB-2 KK chickens which have yellow color shank. Chickens were divided into six bodyweight groups (G1: 700 to 799 g, G2: 800 to 899 g, G3: 900 to 999 g, G4: 1,000 to 1,099 g, G5: 1,100 to 1,199 g, and G6: 1,200 to 1,299 g). Chickens received a commercial feed from DOC to 4 weeks (21-23 % of crude protein) and mixed feed with 59 % commercial feed (phase starter), 19 % wheat pollard, 15 % corn, 5 % soybean meal, and 2 % mineral mix from 6 to 10 weeks. Feed and water were provided ad libitum. The observed variables were the percentage of whole carcass, thighs, breast, wings, back, head and neck, shanks, heart, liver, gizzard, and abdominal fat. The percentage of observed variables is the ratio of the weight of the observed variable to the bodyweight of chicken before it is slaughtered. In this study, the carcass weight was weighted after removing feathers, blood, head, neck, shank, and offal components.

Observed data were analyzed by a one-way ANOVA procedure to test the difference of observed variables on different groups of body weight. As a post-test, the Tukey test was performed. All procedures on collecting data in this study comply with the Animal Welfare Committee of the Indonesian Agency for Agricultural Research and Development on animal welfare with registered number Balitbangtan/Balitnak/A/03/2020.

3. Results and discussion
The average percentage of carcass and non-carcass of 10 weeks old male KUB-2 KK chickens on different bodyweight groups are presented in table 1 and table 2. The average percentages of the carcass in different groups of body weight were significantly different (P<0.05). The average percentage of thighs and breast were also significantly different between different bodyweight groups (P<0.05). Chickens with largest body weight resulted higher percentage of carcass (64.10±1.40%), thighs (22.97±0.68%), and breast (17.28±0.71%) compared to smallest chickens (P<0.05) (61.12±1.58% for carcass, 21.72±0.49 % for thighs and 15.80±0.57 for breast). Carcass percentage of male KUB-2 increased along with increasing body weight. This result was in line with the report of Brake et al (1993) and Hidayat and Iskandar (2017) [7,8]. The percentage of thighs and breasts in this study also increased with increasing body weight.

The percentage of wings and back in this study were not different statistically between different bodyweight groups (P<0.05). Tikle et al (2014) reported that on commercial chicken, the percentage of wings did not increase with the increasing of age, which refers to increasing body weight [9]. It could be occurred since wings no longer used as locomotor mode [9]. Similar to wings, the back is not a locomotor part for chicken. Therefore, it might result in the same percentage of the back between different bodyweight groups.

Table 1. The average carcass percentage of 10 weeks old male KUB-2 chickens on different body weight.

|          | G1 (n=6) | G2 (n=13) | G3 (n=23) | G4 (n=20) | G5 (n=19) | G6 (n=13) |
|----------|----------|-----------|-----------|-----------|-----------|-----------|
| Body weight (g) | 751.83±32.68 | 842.23±26.52 | 959.17±17 | 1,047.35±19 | 1,143.26±25.55 | 1,233.23±22.18 |
| Carcass (%) | 61.12±1.58 | 61.62±2.10 | 62.50±1.56 | 63.47±1.25 | 63.72±1.19 | 64.10±1.40 |
| Thighs (%) | 21.72±0.49 | 21.72±0.92 | 22.32±0.70 | 22.75±0.98 | 23.06±0.84 | 22.97±0.68 |
| Breast (%) | 15.80±0.57 | 16.30±0.94 | 16.40±1.02 | 17.00±1.52 | 16.80±0.73 | 17.28±0.71 |
| Wings (%) | 9.77±0.54 | 9.54±0.48 | 9.42±0.34 | 9.50±0.45 | 9.46±0.38 | 9.47±0.47 |
| Back (%)  | 13.83±0.85 | 14.06±1.06 | 14.36±1.02 | 14.24±0.81 | 14.39±0.79 | 14.38±0.82 |

Different superscripts on the same row indicate significant differences between body weight groups
n= number of chickens, ave= average, sd= standard deviation
The average carcass percentage of male KUB-2 KK chicken in this study was similar to male Gaok chicken and higher than male Sensi-1 Agrinak on the same slaughter age and body weight group based on a study from Komarudin et al. [10]. The percentage of the carcass in this study was also higher than male Sentul chicken reported by Indra et al.[11] and Solikin et al., [12]. Thighs were the largest carcass part in this study. It was followed by breast, back, and wings. Similar results were reported on previous studies on Indonesian local chicken [10,13].

Table 2. The average non-carcass percentage of 10 weeks old male KUB-2 chickens on different body weight.

| Body weight (g) | G1 (n=6) | G2 (n=13) | G3 (n=23) | G4 (n=20) | G5 (n=19) | G6 (n=13) |
|-----------------|----------|-----------|-----------|-----------|-----------|-----------|
| Head and neck (%) | 9.34 ± 1.26 | 9.63 ± 1.32 | 9.10 ± 0.58 | 8.63 ± 0.65 | 8.84 ± 0.82 | 8.99 ± 1.19 |
| Shanks (%) | 4.99 ± 0.49 | 4.88 ± 0.33 | 4.88 ± 0.30 | 4.95 ± 0.27 | 5.11 ± 0.44 | 5.13 ± 0.30 |
| Heart (%) | 0.50 ± 0.08 | 0.52 ± 0.04 | 0.48 ± 0.06 | 0.46 ± 0.06 | 0.48 ± 0.06 | 0.47 ± 0.04 |
| Liver (%) | 2.27 ± 0.45 | 1.98 ± 0.17 | 1.86 ± 0.17 | 1.87 ± 0.17 | 1.76 ± 0.12 | 1.69 ± 0.24 |
| Gizzard (%) | 2.94 ± 0.72 | 3.08 ± 0.63 | 2.95 ± 0.53 | 2.76 ± 0.54 | 2.51 ± 0.46 | 2.32 ± 0.75 |
| Abdominal fat (%) | na | 0.33 ± 0.20 | 0.37 ± 0.20 | 0.35 ± 0.19 | 0.39 ± 0.41 | 0.72 ± 0.56 |

Different superscripts on the same row indicate significant differences between body weight groups n= number of chickens, Ave= average, sd= standard deviation, na= not available.

The percentage of head, neck, and shanks were not different statistically between body weight (P>0.05). While, the percentage of heart, liver, and gizzard were significantly different (P<0.05). It decreased with increasing body weight. Brake et al (1993) reported that offal components, including heart, liver, and gizzard, decreased with increasing body weight [7]. Similar results were also reported by Hidayat and Iskandar (21017) on gizzard and liver [8]. Tikle et al (2014) reported that the percentage of heart decreased with increasing body weight on the broiler [9].

The percentage of abdominal in this study tended to increase with increasing body weight. A tendency of increased abdominal fat as an effect of increasing body weight was reported by Hidayat and Iskandar (20170 on female Sensi-1 chicken [8]. Musa et al (2006) reported that there was a positive correlation between body weight and abdominal fat [14].

4. Conclusion

Bodyweight groups of male KUB-2 KK chicken resulted in different percentages of the carcass. Carcass percentage of male KUB-2 KK chicken increased with increasing body weight. On the other hand, increased body weight resulted in a decreased percentage of non-carcass components such as heart, liver, and gizzard of male KUB-2 KK chicken. Thighs were the biggest part of the carcass. It was followed by breast, back, and wings. Abdominal fat tended to increase with increasing body weight.

References
[1] Padhi M K 2016 Importance of indigenous breeds of chicken for rural economy and their improvements for higher production performance *Scientifica* 2016 1–9
[2] Sartika T and Iskandar S 2019 The productivity of 4th generation KUB-2 Chicken *J. Ilmu Ternak dan Vet* 24 151–7
[3] Iskandar S and Sartika T 2014 KUB-G6 chicken: the first Indonesia Kampung chicken selected for egg production *Proc. 16th AAAP Congr* (Yogyakarta: Indonesian Society of Animal Sciences) pp 157–60
[4] Iskandar S and Sartika T 2014 Produksi telur ayam KUB-G6 dalam sangkar individu dan sangkar koloni *Prosiding Seminar Nasional Teknologi Peternakan* (Malang: Badan Litbang Pertanian pp 650–5
[5] Ditjen Peternakan dan Kesehatan Hewan 2014 SK Pelepasan Galur Ayam KUB-1 Kep Mentan No 274/Kpts/SR120/2/2014. 3:1–15 (Jakarta: Kementrian Pertanian Republik Indonesia)
[6] Mahoro J, Muasya T K, Mbuza F, Mbuthia J and Kahi A K 2018 Farmers’ breeding practices and traits of economic importance for indigenous chicken in Rwanda *Trop. Anim. Health Prod.* **50** 121–8

[7] Brake J, Havestien G B, Scheideler S E, Ferket P R and Rives D V 1993 Relationship of sex, age and body weight to broiler carcass yield and offal production *J. Poult. Sci.* **72** 1137–45

[8] Hidayat C and Iskandar S 2017 Estimation of empty carcass and carcass cuts of female SenSi-1 Agrinak chicken *J. Ilmu Ternak dan Vet.* **22** 24–9

[9] Tickle P G, Paxton H, Rankin J W, Hutchinson J R and Codd JR 2014 Anatomical and biomechanical traits of broiler chickens across ontogeny. Part I. Anatomy of the musculoskeletal respiratory apparatus and changes in organ size *Peer J.* **432** 1–17

[10] Komarudin, Sartika T, Kostaman T and Pratiwi N 2020 Analisis komponen karkas ayam gaok dan SenSi-1 Agrinak pada umur dan bobot potong yang sama *Prosiding Webinar Nasional Persepsi 29 May 2020* (Padang: Universitas Andalas)

[11] Indra W, Tanwiriah W and Widjastuti T 2015 Bobot potong, karkas, dan income over feed cost ayam sentul jantan pada berbagai umur potong *Student E-journals* **4**

[12] Solikin T, Tanwiriah W, and Sujana E 2016 Bobot akhir, bobot karkas dan income over feed and chick cost ayam sentul Barokah Abadi Farm Ciamis *Students E-journal* **5**

[13] Marsetyo, Marfuah N dan Hafsah 2015 Pengaruh level penggunaan daun katuk (*Saoropus androgynus*) pada ransum terhadap penampilan produksi dan persentase karkas ayam kampung *Online J. Natur. Sci.* **4** 73–83

[14] Musa H H, Chen G H, Cheng J H, Li B C and Mekki D M 2006 Study on carcass characteristics of chicken breeds raised under the intensive condition *Int. J. Poult. Sci.* **5** 530–3