Carcass and Meat Quality Pelung Sentul Kampung Broiler Crossbreed Chicken

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Abstract. Crossbreed chicken of pelung sentul kampung broiler (PSKR) has good growth and ready to slaughter at the age of 10 weeks. So, it has potential as a local chicken for meat producers. Potential of PSKR crossbreed chicken need to know about the percentage of carcass and the physical quality of meat for holistic information. This study aimed to evaluate the carcass and the quality of the physical meat of pelung sentul kampung broiler chicken (PSKR). Material of 12 chickens PSKR 12 weeks unsexing were used and observed for the percentage of carcass in the chest, upper and lower thighs and physical quality of breast meat included pH, water-binding power, cooking impurities, and tenderness. Chickens fed 100% commercial feed for broiler chicken phase starter until age 3 weeks, then gradually added rice bran and age > 5 weeks fed 60% commercial feed plus 40% rice bran. Chicken is slaughtered at 12 weeks of age. The data obtained are presented descriptively. Percentage of PSKR carcass was 68%, chest was 27.17%, upper thigh was 17.12%, lower thigh was 16.64% respectively. Physical quality of breast meat has a pH performance of 5.30%, % mgH₂O of 28.08%, cooking loss of 29.13%, and tenderness of 2.63 respectively. PSKR chicken had potential for meat producers based on carcass percentage with chest meat was very tender because the genetic of broiler in PSKR as much as 25%.

Keywords: carcass, meat quality, PSKR

1. Introduction

The demand for poultry meat increases as the public awareness raises the importance of animal protein for health. Currently poultry meat needs are supplied by broiler products, while local chicken meat production is ranked second after broiler. Efforts to increase the potential of local chickens as meat producers can be done through selection and crossing. The cross breeding of pelung sentul kampung broiler so that obtained by PSKR chicken is one of effort to increase the productivity of local chicken. PSKR chickens have better growth performance than chicken can reach 1.2 kg at 10 weeks of age (Darwati et al. 2017). PSKR chicken has potential as a producer of meat from local origin. PSKR chicken has a genetic composition of 75% local chicken and 25% broiler chicken.

The advantage of PSKR crossbreed chicken can be slaughtered at a young age as a meat producer. The higher carcass obtained from PSKR chickens can therefore be expected to provide information that local chickens can contribute as a producer of poultry meat. Meat is one of the important farm commodities to meet the needs of animal protein community. Poultry is a good source of animal protein because it contains complete and balanced essential amino acids. BPS (2016) reported that in 2016 the production of broiler meat is 1,689,584 tons and local chicken production is 315,538 tons. Until now the needs of
chicken meat in Indonesia is much supplied by chicken meat broiler. Besides carcass, the study of the quality of PSKR chicken meat will be better. By the need to continue to develop research to explore the potential of local chicken as a producer of good quality meat. This study aimed to evaluate the carcass and physical quality of PSKR chicken.

2. Materials and method

Chicken samples used in this study were 12 chickens PSKR unsexing age 12 weeks. Chickens were kept from DOC until 12 weeks of age. Chickens fed 100% commercial feed for broiler starter to 3 weeks of age, > 3-4 weeks were given 80% commercial feed broiler phase starter + 20% rice bran, > 4-5 weeks fed 70% commercial feed broiler phase starter + 30% rice bran, > 5-12 weeks fed 60% commercial feed broiler phase starter + 40% rice bran. Chicken is slaughtered to obtain carcass percentage at 12 weeks of age. Drinking water is given ad libitum. Vita chicks is given at DOC until the age of 2 weeks. Furthermore given conditional.

Chickens are cut in accordance with Islamic Shariah in the Field Laboratory of Breeding and Animal Genetics of IPB. Definition of carcass is the remains of plucked and dressed chicken after the legs, breasts and wings have been removed. Commercial pieces of carcasses are divided according to commercial pieces. The commercial cut is weighed. The commercial carcass parts observed include the chest, upper thigh, and lower thigh to obtain commercial carcass percentages of the chest, upper thighs, and lower thighs. Carcass of chest section was skinned and trimmed. Furthermore, breast meat analysed physical qualities include meat pH, water holding capacity, cooking loss, and tenderness.

pH measurements of meat based on Van Laack et al. (2000). Calibrated pH meter was pinned into sample of meat, then wait until the pH meter screen shows the pH value of the meat. Subsequently, water holding capacity (WHC) refers to Soeparno (2005). The measurement of water holding capacity of meat was done by carper press and planimeter. 0.3 g of meat samples were placed on filter paper and covered with other filter paper on top then the samples were pressed with carper press maximally (kg cm\(^{-2}\)) until the outer circle and inner circle formed, then calculate total H\(_2\)O content were out of the sample. Afterward, cooking loss is the amount of water lost and nutrients dissolved in water due to cooking. Measurement of cooking loss is based on Bouton et al. (1971). The meat samples were weighted, then boiled until the meat temperature reached 81 ° C. Meat drained to constant weight. Cooking loss is calculated from the gap of weight before and after cooking then compared to the weight before cooking in percentage. Afterward the tenderness level is based on Suryati et al (2008) that the level of meat tenderness is expressed by the amount of strength (kg cm\(^{-2}\)) required to cut the meat and shown by the needle pointer of Warner Bratzler meat device that moves above the scale with a measurement sensitivity of 0.1 kg cm\(^{-2}\). The data obtained were analysed descriptively.

3. Results and discussion

3.1. Percentage of carcass

The result of carcass was obtained as shown in Table 1 in this study. Carcass is the remains of plucked and dressed chicken after the legs, breasts and wings have been removed. Carcass performance includes percentage of carcass weight, and percentage of chest, tibia and femur which have high commercial value in chicken carcass. Carcass is a slowly ripe organ, so with increasing age, growth increases and the percentage of live weight increases (Matitaputty et al. 2011). Moreover, genetic composition is influence the carcass crop. PSKR crossbreed chicken has 25 % genetic potential of each Pelung, Sentul, Kampung, and Broiler.

The percentage of chicken carcass of PSKR is higher than research of Pesti and Bakali (1997) that the percentage of broiler carcass of 5 weeks harvest age is 60.52% -69.51%. Means PSKR chicken has the ability as a meat-producing chicken with the genetic composition of 25% broiler and 75% of local chicken in chicken PSKR.
Table 1. Percentage of Carcass, chest part, top thigh, and bottom thigh PSKR crossbreed chicken

| Traits                   | Mean±Sd (C.V. %) |
|--------------------------|------------------|
| Carcass (%)              | 68.06±3.10 (7.86) |
| Chest part (%)           | 27.17±1.84 (3.68) |
| Top thigh (%)            | 17.12±0.60 (3.51) |
| Bottom thigh (%)         | 16.64±0.50 (3.00) |

The percentage of chest carcass in this study was higher than the research of Lubis (2017) that the chicken carcasses age of 26 weeks on the chest 25.51%. While in this study amounted to 27.17%. In contrast, upper thigh carcass and lower thighs were lower than Lubis (2017) ie 19.5% and 18.3%. Chest is a place of the largest muscle deposits in chickens, thus PSKR chicken have meat on the carcass which has high economic value.

3.2. Quality of Carcass

Result of PSKR meat test for PSKR meat quality indicator. The quality of PSKR chicken is presented in Table 2.

Table 2. The quality of carcass crossbreed chicken PSKR

| Meat quality | Average | Range     |
|--------------|---------|-----------|
| Ph           | 5.30±0.08 | 5.17-5.46 |
| %mgH2O       | 28.08±2.72 | 24.00-34.53 |
| Tenderness   | 2.63±0.34 | 2.1-2.3   |
| % Cooking loss | 29.13±6.11 | 16.00-36.50 |

The pH parameters affect the quality of meat sensory, ie color, texture / tenderness, and taste (Min and Ahn 2005). In this study the average pH of PSKR meat was 5.30. Van Laack et al. (2000) stated that the pH value of broiler chicken meat ranged from 5.96 to 6.07, Dewi (2013) reported that chicken meat pH ranged from 5.91 to 5.93.

The water holding capacity represents the percentage of the amount of water discharged. Water retained in the muscle is negatively correlated with the water holding capacity. PSKR breast meat has a water holding capacity in this study of 28.02% lower than Winarso (2003) that kampung chicken meat has 29.94% water holding capacity. Suradi (2006) exposed that water holding capacity broiler chicken was in the range 17.8-45.37%, with the result of that PSKR still in the range of broiler chicken. Soeparno (2011) states that water-binding power is the ability of meat proteins to bind or retain water content in response to external force applications such as cutting, cooking, and meat milling. Water-binding power is also associated with meat pH (Alvarado et al. 2007). A high pH value can improve the water holding capacity. Pearson and Young (1989) suggest that water will increase if the pH value of the meat increases.

The mean of cooking loss in this research was 29.13%. Winarso (2013) reported the cooking loss of chicken meat in the village by 16.62%. Means cooking loss of chicken breast meat PSKR was in the normal range.

The tenderness of PSKR chicken meat was extremely tender. Suryati et al. extremely tender (<3.3 kg cm\(^2\)), tender (3.3-5.0 kg cm\(^2\)), rather tender (5.0-6.71 kg cm\(^2\)), rather tough (6.71-8.42 kg cm\(^2\)), tough (8.42-10.12 kg cm\(^2\)), and extremely tough (>10.12 kg cm\(^2\)). Soeparno (2005) mentioned that the factors that influence meat tenderness are antemortem, genetic, age, sex, and stress level.

4. Conclusion

Carcass crop of PSKR crossbreed chicken in the range of average carcass crop of broiler chicken, so PSKR crossbreed chicken has potential as a local chicken for meat producers. Meat quality of PSKR crossbreed chicken was classified into extremely tender.
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