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Bobot dan Persentase Bagian Karkas Itik Cihateup yang Diberi Ransum Mengandung Kombinasi Ampas Teh Hijau Fermentasi dan Probiotik *Lactobacillus sp.*

Carcass Weight and Carcass Percentage of Cihateup Ducks Fed Diet Containing Combination of Fermented Green Tea Waste and Probiotics *Lactobacillus sp.*

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***Abstrak** : Itik Cihateup merupakan ternak unggas yang diduga berpotensi dalam menghasilkan daging. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian kombinasi ampas teh hijau fermentasi (ATHF) dan probiotik Lactobacillus sp. terhadap bobot karkas dan persentase bagian karkas itik Cihateup. Penelitian dilakukan secara eksperimen pada 60 ekor DOD itik jantan afkir dengan 4 perlakuan yaitu P1 (Pakan komersial 100%), P2 (Pakan komersial + 1% ATHF + 3% probiotik), P3 (Pakan komersial + 2% ATHF + 2% probiotik), dan P4 (Pakan komersial + 3% ATHF + 1% probiotik) sebanyak 5 kali ulangan. Penelitian menggunakan rancangan acak lengkap (RAL), metode analisis menggunakan ANOVA dengan uji lanjut Duncan's Multiple Range Test (DMRT). Hasil penelitian menunjukkan kombinasi ATHF dan probiotik tidak berpengaruh nyata (P>0,05) terhadap bobot dan persentase bagian karkas, akan tetapi pada parameter bobot karkas bagian punggung menunjukkan pengaruh yang nyata (P<0,05). Pemberian ATHF 1% + probiotik 3% (P2) menunjukkan nilai rataan bobot karkas bagian punggung tertinggi dibandingkan perlakuan lainnya.*

***Kata Kunci :** ampas teh hijau, bobot karkas, itik Cihateup, persentase karkas, probiotik.*

***Abstract :** Cihateup ducks are poultry that are believed to have potential for meat production. This study aims to determine the effect of feeding a combination of fermented green tea waste (ATHF) and probiotics Lactobacillus sp. on the carcass weight and carcass percentage of Cihateup ducks. The study was conducted experimentally on 60 male Cihateup ducks with four treatments: P1 (100% commercial feed), P2 (commercial feed + 1% ATHF + 3% probiotics), P3 (commercial feed + 2% ATHF + 2% probiotics), and P4 (commercial feed + 3% ATHF + 1% probiotics) with 5 replicates. The study used a completely randomized design (CRD), and the analysis method used ANOVA with DMRT post hoc test. The results showed that the combination of ATHF and probiotics had no significant effect (P>0.05) on carcass weight and percentage, but had a significant effect (P<0.05) on back carcass weight. The administration of 1% ATHF + 3% probiotics (P2) showed the highest average back carcass weight compared to other treatments.*

***Keywords :** carcass percentage, carcass weight, Cihateup duck, green tea waste, probiotics.*

1. Introduction

Duck meat is still not popular in the development of industrial-scale livestock commodities that have the potential to increase meat consumption. Cihateup ducks are local ducks that have the potential to produce good meat [1]. In addition to being good egg producers, Cihateup ducks also have great potential to become prospective meat-producing livestock. Poultry productivity can be seen from how the growth results during maintenance. Starting from body weight gain, feed conversion, feed consumption to final weight. Body weight and feed consumption will increase with age [1]. Live weight and slaughter weight greatly influence the carcass weight and carcass percentage that will later be marketed. Carcass percentage is influenced by several factors such as livestock breed, physical condition, feed, and body weight [2]. The type of feed is one factor that greatly influences the growth

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rate of livestock. Its content will greatly contribute to determining optimal livestock growth.

Green tea waste is believed to have a sufficient protein and antioxidant content to be added to feed for livestock growth. The polyphenol compounds with strong antioxidants found in green tea make it more effective than Vitamin C and E [3,4]. Considering its content, it is necessary to conduct experiments on its addition to livestock feed. Green tea waste can also be processed into fertilizer for plants. Its beneficial content and the fact that it does not compete with human food sources, as well as its affordable price and availability, make green tea waste a potential additive for livestock feed. In addition to the many nutrients that support growth, green tea waste also contains antinutrients that can interfere with livestock digestion. Because of this, it needs to be processed, one way being through fermentation.

Green tea waste is reported to contain 93.59% dry matter, 88.08% organic matter, and 19.63% crude protein, but it also has a fairly high tannin and crude fiber content of 7.91% and 17.40%, respectively [5,6]. The fermentation process is commonly used to reduce the high crude fiber content in forage. Crude fiber can be reduced by EM4 through the reaction of decomposing fungi contained within it to break down the cellulose in green tea waste. In addition to reducing fiber, the fermentation process in green waste can also increase the nutritional content of the fermented feed material. In addition, Lactobacillus sp. probiotics can also be an added value because their content can increase nutrients in feed and balance the population of good microorganisms. Lactobacillus sp. is a species that is often used as feed additives due to its lactic acid content. Probiotics can improve feed digestibility and livestock health by maintaining the composition of microorganisms in the digestive system of livestock [7].

The combination of fermented green tea pulp and probiotics has never been tested on Cihateup ducks. This combination is expected to have a positive effect on duck growth. The addition of probiotics to fermented green tea pulp is thought to aid in the absorption of green tea pulp in the feed given to Cihateup ducks. Good growth will affect final weight and ultimately correlate with improved carcass weight and carcass percentage of Cihateup ducks.

2. Materials and Methods

2.1. Materials

The research materials used included 60 male Cihateup ducks, green tea waste, EM4 fermenter, commercial feed, probiotics (Lactobacillus sp.), drinking water, minerals, vitamins, and medicines. The tools used included duck cages, feeders, drinkers, and digital scales.

2.2. Procedures

In the process of making fermented green tea waste, sorting and decomposition of the green tea waste is carried out beforehand to facilitate the mixing process. After mixing homogeneously, all ingredients are then mixed together, starting with 100 ml of water, 5 ml of EM4 (effective microorganism-4) and 5 ml of molasses for 1 kg of green tea waste. The fermentation method used is anaerobic for 7 days at a temperature of 210C_ 250C. The Cihateup duck livestock is maintained for 56 days and after harvesting, the weighing process continues, which requires plastic, labels, scales, knives, and containers to separate each sample of the treatment group.

2.3. Research Design

The research design used was a completely randomized design (CRD), with 4 treatments and 5 replicates, and each replicate used 3 samples, resulting in a total of 60 ducks. The treatments involved feeding rations supplemented with a combination of fermented green tea waste and Lactobacillus sp. probiotics at different percentages, namely:
P1 = 100% commercial feed,
P2 = commercial feed + 1% ATHF + 3% probiotics,
P3 = commercial feed + 2% ATHF + 2% probiotics,
P4 = commercial feed + 3% ATHF + 1% probiotics.

The data tested included: Carcass weight, which can be determined by weighing the ducks that have been slaughtered, cleaned, and separated from the head, feet, offal, feathers, heart, neck, and lungs. The percentage of Cihateup duck carcass parts can be obtained using the formula: carcass part weight / carcass weight x 100%.

2.4. Data Analysis

The data obtained were analyzed using the Analysis of Variance (ANOVA) statistical model. If significant results were obtained, Duncan's Multiple Range Test (DMRT) was performed using SPSS Version 22 software.

3. Results and Discussion

3.1. Carcass Weight

Table 1. Average carcass weight of Cihateup ducks fed a ration containing a combination of ATHF + Probiotics Lactobacillus sp.

Treatments	Carcass Weight (g)
P1	553.80 ± 82.29[a]
P2	589.60 ± 101.69[a]
P3	477.60 ± 71.56[a]
P4	563.20 ± 54.27[a]
Mean	546,05 ± 77,45

Note: No significant difference (P>0.05).

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The results of the analysis showed no significant effect (P>0.05) of each treatment on the carcass weight of Cihateup ducks. Previous studies with the addition of 1% and 2% fermented green tea waste can improve daily weight gain [8]. The effect on weight gain was not consistent with the significant effect on carcass weight. The treatment with 1% ATHF and 3% Lactobacillus sp. (P2) achieved 589.60 g, which was the highest average value of all treatments. The treatment with 3% ATHF and 1% Lactobacillus sp. (P4) numerically produced a higher average carcass weight than the control treatment. The addition of the combination of ATHF and Lactobacillus sp. was numerically higher but not significantly different and did not have a negative effect on carcass weight, although not entirely.

Meat is body tissue that will eventually produce carcasses. Protein in feed that enters the digestive tract of livestock will be absorbed by the small intestine and form body tissue called meat. Antinutrients such as tannins, saponins, and others can also affect this process. Protein can be bound by tannins to form complex bonds that make it difficult for protease enzymes to digest protein [9]. Protein contained in feed and ATHF will also be less optimally digested by livestock.

Fiber fermented by microbes produces cellulase enzymes that break down coarse fiber into simple complex carbohydrates, which take longer to digest. Poultry are not as good as ruminants at digesting complex carbohydrates, especially from coarse fiber. Coarse fiber has bulky or stomach-filling properties, which cause livestock to stop eating sooner [1]. This bulky nature is thought to be related to how feed consumption can decrease and also affect carcasses.

The addition of green tea pulp with antioxidant content that can prevent stress in livestock by fighting free radicals is thought to disappear due to the fermentation process that oxidizes antioxidants in green tea pulp. Free radicals can cause damage to proteins, DNA, and cell membranes. Green tea is processed by heating without fermentation to prevent oxidation of antioxidants [10]. Suboptimal absorption of feed content can also result in the addition of ATHF and Lactobacillus sp. not being maximized.

3.2. Weight and Percentage of Breast

Table 2. Average weight and percentage of breast meat in Cihateup ducks fed a combination of ATHF + Probiotics Lactobacillus sp.

Treatments	Breast Weight (g)	Percentage of Breast (%)
P1	108.60± 22.19^{a}	19.48 ± 0.02^{a}
P2	106.00± 22.36^{a}	17.94 ± 0.02^{a}
P3	85.40 ± 25.89^{a}	18.00 ± 0.04^{a}
P4	117.20 ± 20.09^{a}	20.70 ± 0.02^{a}
Mean	104.30 ± 22.63	19.08 ± 0.02

Note: No significant difference (P>0.05).

The administration of ATHF and Lactobacillus sp. had no significant effect on weight and breast percentage (P>0.05), where the results of P1 with P2, P3, and P4 were not significantly different (P>0.05). Research conducted [11] also produced the same results and stated that the weight of the cut was closely related to the weight of the carcass and its parts, and that the breast was greatly influenced by the weight of the cut. Therefore, if the analysis did not produce a significant effect (P>0.05) on the weight of the cut and the carcass weight, the same results would also be obtained for the carcass parts.

It is widely known that the breast is a part with thicker meat, but the addition of ATHF and Lactobacillus sp. did not have a significant effect (P>0.05). Factors that can influence this include the breast growing more slowly than overall growth and also the age at slaughter, where the older the bird, the greater the muscle growth. A slaughter age of 10-12 weeks in local male ducks resulted in a higher breast percentage compared to a slaughter age of 8 weeks [11]. In line with the opinion [12] that slaughter age can affect carcass percentage, the percentage will increase with increasing slaughter age.

The effectiveness of the compounds contained in ATHF+ Lactobacillus sp. is suspected to be less than optimal in terms of absorption, resulting in no increase in weight and breast meat percentage. The content of tannins, polyphenols, flavonoids, saponins, and other antinutrients in green tea waste may also affect carcass weight percentage from feed intake and body weight gain [13].

3.2. Weight and Percentage of Back

Table 3. Average weight and percentage of back meat in Cihateup ducks fed a combination of ATHF + Probiotics Lactobacillus sp.

Treatments	Back Weight (g)	Percentage of Back (%)
P1	171.60 ± 27.92^{ab}	30.96 ± 0.01^{a}
P2	196.60 ± 31.78^{b}	33.44 ± 0.01^{a}
P3	157.60 ± 16.72^{a}	33.32 ± 0.03^{a}
P4	177.20 ± 13.26^{ab}	31.54 ± 0.02^{a}
Mean	175.76 ± 22.42	32.32 ± 0.02

Note: Different superscripts in the same column indicate significant differences (P<0.05).

Duncan's post-hoc test showed a significant difference (P<0.05) between P2 and P3 but no significant difference (P>0.05) with P1 and P4. The addition of the ATHF + Lactobacillus sp. combination had a significant effect (P<0.05) on the weight of the back carcass, where treatments P1 and P4 did not differ significantly (P>0.05) from P2, while P2 differed significantly (P<0.05) from P3. The administration of 1% ATHF + 3% Lactobacillus sp. (P2) was better than the administration of 2% ATHF + 2% Lactobacillus sp.

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(P3), with an average result of 196.60 g for P2. However, the back carcass weight value in P3 was not significantly different from P1. The addition of Lactobacillus sp. probiotics with the aim of helping to balance the microflora in the digestive system was also considered to be better in increasing nutrient digestibility.

The significant difference in the weight of the back carcass between P2 and P3 was not directly proportional to the percentage. The percentage of the back carcass did not show any significant differences between the four treatments. The 1% ATHF and 3% Lactobacillus sp. (P2) treatments showed a higher average percentage than all other treatments, which means that the addition of ATHF and Lactobacillus sp. did not have a negative effect. The back is a part that has a high percentage of bone and produces little meat or has low potential [14]. The significant difference in the weight of the back with a higher average is thought to result from the large amount of bone that dominates the back carcass. Bone and muscle growth can be said to be faster than the relative growth rate, so an increase in the ratio of bone and muscle during the growth period is very possible.

Tea waste fermented by Aspergillus niger in study [15] states that in addition to crude protein and crude fiber content, mineral content such as calcium and phosphorus reached 0.891% and 0.211%, respectively. This content is also expected to help improve bone growth. The posture of ducks after harvest also appears to be large due to the prominent and large bones in the duck's body but with little meat.

Research conducted [16] with the addition of fermented mung bean sprout flour to Balinese ducks did not produce any significant differences. In fact, the average percentage produced was smaller than in this study, which was 26.15%, while in this study the average percentage of the back carcass reached 32.32%.

3.3. Weight and Percentage of Wings

Table 4. Average weight and percentage of back meat in Cihateup ducks fed a combination of ATHF + Probiotics Lactobacillus sp.

Treatments	Wings Weight (g)	Percentage of Wings (%)
P1	75.60 ± 13.34^a	13.62 ± 0.01^a
P2	74.60 ± 21.38^a	12.40 ± 0.02^a
P3	56.20 ± 17.66^a	11.50 ± 0.04^a
P4	76.00 ± 11.45^a	13.44 ± 0.01^a
Mean	70.60 ± 15.96	12.83 ± 0.02

Note: No significant difference (P>0.05).

The percentage of carcass weight in the wing section can be said to be similar to that in the back section. The wing also has a larger bone structure compared to the meat. The wing itself has a higher bone and fat content than meat, so it is very likely that the percentage of meat is smaller. Low bone and fat deposits dominate the wing section, so the wing is not the main site of muscle deposition [16]. The results of the analysis of variance in Table 4 show that there are no significant differences between each treatment, which means there is no significant effect (P>0.05). The total average of the four treatments only produced 12.83%, which is lower than the study [15] that used discarded bread flour with mangosteen peel flour, which also had no significant effect, producing an average wing percentage of 19.84%. A higher wing percentage was also produced in study [14] with the addition of betel leaf and kecombrang flower solution, which reached 14.96%, and study [18] with the addition of mangosteen peel flour and turmeric flour, which produced an average wing carcass percentage of 18.29%. The results of this study show a higher wing carcass percentage than study [19], which administered 0.5% and 1% probiotics to Bali ducks, with percentages of 5.12% and 1.70%, respectively.

3.4. Weight and Percentage of thigh

Table 5. Average weight and percentage of thigh meat in Cihateup ducks fed a combination of ATHF + Probiotics Lactobacillus sp.

Treatments	Thigh Weight (g)	Percentage of Thigh (%)
P1	163.40 ± 20.30^a	29.60 ± 0.01^a
P2	172.80 ± 30.10^a	29.58 ± 0.03^a
P3	139.00 ± 20.00^a	29.30 ± 0.02^a
P4	163.80 ± 9.50^a	29.22 ± 0.02^a
Mean	159.70 ± 20.00	29.42 ± 0.02

Note: No significant difference (P>0.05).

The results of the analysis showed no significant differences (P>0.05) between treatments, indicating that the addition of ATHF + Lactobacillus sp. had no significant effect on thigh weight and percentage. Similar to study [11], there was no significant difference in thigh weight and percentage, but the average whole thigh weight with the addition of kecombrang flower solution reached 220.56g. This weight was greater than that in this study, which only reached 159.7g, but the carcass percentage in this study was significantly greater at 5.62%. The thigh carcass portion is the largest source of meat besides the breast. Slaughter weight is thought to greatly influence thigh weight; in other words, if the analysis shows no significant effect on slaughter weight and carcass weight, then thigh weight will also not be significantly affected. The constant growth pattern of the thigh carcass portion is also thought to influence it, especially in terms of body development. The low percentage of thigh meat is due to the high slaughter age [20]. Slaughter age can affect the percentage of thigh meat in the carcass; the higher the slaughter age, the lower the percentage, and the

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best average percentage of thigh meat in the carcass occurs at a slaughter age of 4 weeks.

4. Conclusion

The addition of a combination of fermented green tea waste and Lactobacillus sp. probiotics had a significant effect (P<0.05) on the weight of the back carcass, but there was no significant difference (P>0.05) in the weight and percentage of other carcass parts. The application of treatment (P2) to the Cihateup duck diet improved the back weight to a level of 157.60 g – 196.60 g, thereby having a positive effect on increasing the weight of the back part of the carcass.

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