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Non-Carcass Parts of Local Male Ducks Fed Commercial Feed Supplemented with Torch Ginger (*Etlingera elatior*) Flower Extract

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Abstract: The torch ginger (*Etlingera elatior*) is a herbaceous plant the flower of which is commonly used in feed to improve the quality of meat. This study was aimed at assessing the effects of giving commercial feed non-carcass portions of local ducks. The study was conducted at the Poultry Farm of Department of Animal Husbandry Djuanda University, Bogor, from June to August 2016. Twenty four 2-week-old male local ducks were used. Completely randomized design with 4 treatments and 3 replicates was used. The treatments consisted of 100% of commercial ration (R0), commercial ration + 2.5% of TGE solution (R1), commercial ration + 5% of TGE solution (R2), and commercial ration + 7.5% of TGE solution (R3). The feeding trial lasted 6 weeks after which the ducks were slaughtered and carcass weight, dressing percentages and carcass parts were measured. The percentage of non-carcass parts including head, neck, shank, liver, heart, gizzard, feathers, blood and intestines were also measured. No significant effect of treatments ($P > 0.05$) on all parameters measured were found. It was concluded that the inclusion of TGE solution in commercial ration up to 7.5% did not significantly affect the live weight, weight and percentages of non-carcass parts including blood, feathers, head, neck, shank, liver, gizzard, heart, and intestines.

Keywords: commercial ration, male local duck, non-carcass, torch ginger flower extract solution

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1. Introduction

Local ducks as a source of meat plays a very important role in meeting Indonesia needs for animal protein. One of te varieties of local poultry mostly developed is ducks. In Indonesia few research are conducted to determine optimal feeding of local ducks hence, little is known about effect of herbal supplementation on growth performance and meat quality.

Torch ginger (*Etlingera elatior*) is a species of herbaceous plant that contains about 0.0334% essential oil and antioxidants in the flowers. These compounds which have antibacterial properties and act as antioxidants [3], [4], [5], [6]. The active ingredients contained in torch ginger are: glycoside, phenolic, steroids, saponins, triterpenoids, tannins and alkaloids. The utilization of torch ginger as an additive in poultry diets has been tried out for various purposes

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[7], [8]. This study aims at examining the use of commercial feeding and torch ginger flower extract solution to the non-carcass parts of local ducks.

2. Materials and Method

This research was conducted from June to August 2016 in the poultry laboratory of Animal Husbandry Program of Universitas Djuanda, Bogor. This study used twenty four 2-week-old local male ducks (average weight of 450 ± 53.04 g).

The ducks were placed in individual battery cage measuring 43 x 50 x 50 cm with the inclination of 9° equipped with trays for droppings, feeders and drinkers.

Table 1. Nutrient Content in the BR-21E Commercial Diet

No.	Composition	Nutrient Content (%)	
1.	Water Content (max)	12*	10.02**
2.	Crude Protein	20 – 22*	20.06**
3.	Crude Fat (min)	5*	4.72**
4.	Crude Fibre (max)	5*	3.14**
5.	Ash (max)	8*	5.11**
6.	Calcium	0.8-1.1*	
7.	Phosphor	0.5*	

Source: *PT. Shinta Prima Feedmill (2016), ** Laboratory of IPB (2016)

2.1. Dietrary Treatments

The treatment was the provision of ration with the compositions: R0 = commercial diet, R1 = commercial diet + 2.5% of TGE solution, R2 = commercial diet + 5% of TGE solution, R3 = commercial diet + 7.5% of TGE solution. The content of crude protein of ducks ranged from 20% to 22%.

2.2. Data Collection

At the age of 56 days the ducks were slaughtered and the data collected were (1) Body Weight (g): Body weight was known by weighing the duck before slaughtering; (2) Non-Carcass (%) = The non-carcass weight divided by the body weight multiplied by 100%; (3) Blood (%) = The blood weight divided by the body weight multiplied by 100%; (4) Feather (%) = The feather weight divided by the body weight multiplied by 100%; (5) Head (%) = The head weight divided by the body weight multiplied by 100%; (6) Neck (%) = The neck weight divided by the body weight multiplied by 100%; (7) Shank (%) = The shank weight divided by the body weight multiplied by 100%; (8) Liver (%) = The liver weight divided by the body weight multiplied by 100%; (9) Gizzard (%) = The gizzard weight divided by the body weight multiplied by 100%; (10) Heart (%) = The heart weight divided by the body weight multiplied

by 100%; (11) Intestine (%) = The intestine weight divided by the body weight multiplied by 100%.

2.3. Experimental Design

This study used a completely randomized design with 4 treatments and 3 replications, each replication used 2 local male ducks. The data analysis was done using Anova test. When the results showed an significan effect ($P < 0.05$) or very significant effect ($P < 0.01$), then the analysis was proceeded to Duncan test to know the difference between the treatments.

2.4. Implementation Procedures

Cages were cleaned using a disinfectant, and a base was provided under the cage to accommodate the excreta. The food tray and the drink container were placed in every partition of the cage and the lights were installed around the cage. The torch ginger flower used should be fresh. In preparing the solution, the torch ginger flower was washed and cleaned. Then, it was chopped into smaller size (± 0.3 cm), and then was mashed using a mortar. Next, it was mixed with water with the ratio of 600 g of torch ginger flower in 1 liter of water, and the mixture was boiled in small flame for 30 minutes. After that, it was cooled and filtered. The torch ginger flower extract solution is ready to be used as a mixture in the ducks' food. The ducks used in this study were healthy, bright eyeds, disability-free and active. The ducks were weighed, allowed 7 days adaptation followed by data collection for 4 weeks.

At the end of the feeding trial (56 days of age). The ducks were starved for 12 hours and slaughtered according to the Halal procedures. After slaughter the carcasses were hung with the head down position for the maximal blood withdrawal. After the blood stopped flowing, the ducks were weighed to determine their blood weight, and then the carcasses were dunked into hot water with a temperature of 80-95 °C for 5 to 10 seconds for removal of the feathers.

Separating the ducks' body parts began with the removal of internal organs. Furthermore, the breast and abdomen parts were cut, the internal organs were discarded, washed, drained and weighed. Cutting the head was done by cutting the atlanto occipitalis, while cutting the neck was done by cutting the joint between os vertebrae cervicalis and os vertebrae thoracalis, then cutting the shanks was done by cutting the joint between os tarsal and os tibia.

3. Results and Discussion

The result of data analysis of giving torch ginger flower extract solution against the percentage of non-carcass parts of ducks is presented in Table 2.

Table 2. Percentage of Non-carcas Part of Local Male Ducks

Treatment	Percentage (%)					
	Non-carcass	**Blood**	**Feather**	**Head**	**Neck**	**Shank**
R0	43.08±0.97	8.47±0.19	7.96±0.340	5.11±0.02	5.08±0.95	2.29±0.04
R1	42.83±2.48	8.67±0.80	8.17±0.74	5.20±0.56	5.26±0.37	2.45±0.30
R2	46.11±0.36	9.19±0.41	8.28±0.43	5.68±0.06	4.90±0.44	2.58±0.19
R3	44.21±2.35	8.61±0.93	8.64±0.79	5.10±0.56	4.82±0.99	2.31±0.03
Mean	**44.06±2.03**	**8.74±0.63**	**8.26±0.59**	**8.26±0.59**	**5.01±0.66**	**2.41±0.19**

Notes: R0 = Commercial Diet; R1 = Commercial Diet + 2.5% of torch ginger flower extract solution; R2 = Commercial Diet + 5% of torch ginger flower extract solution; R3 = Commercial Diet + 7.5% of torch ginger flower extract solution

Based on the analysis of variance (Table 2), the effect of giving torch ginger flower extract solution against the percentage variables of non-carcass parts, blood (blood, feather, head, neck and shank) showed no significant difference (P> 0.05). The mean percentage of non-carcass parts was 44.06 ± 2.033%. This mean percentage was lower than the result of the study done by Pasang [9] with the mean percentage of 46.94%, but higher than the results of the studies done by Daud *et al.* [10] with the mean percentage of 42.82% and Putra *et al*. [11] with the mean percentage of 43.35%.

The result of variance analysis (Table 2) showed no significant difference (P > 0.05) on the percentage of blood variable (8.74 ± 0.626%) and the percentage of feather variable (8.26 ± 0.585%). The results of this research were higher than the results of Isnaini's [12] research where the cross-breeding ducks (of Muscovy duck and Cihateup duck) had a blood percentage of 6.49 ± 1.75%. The results of this study were still within the range of blood percentage in Wardhana *et al.* [13] who suggested that the percentage of blood in the body was 5% to 10% of the body weight, depending on the species and the nutritional state of livestock. The percentage of feather found in this research was higher than the results of the research done by Randa *et al*. [14] who found that the percentage of feather was 7.98%. The giving of torch ginger flower extract solution up to 7.5% had not given a significant effect on the percentage of ducks' blood and feather.

Based on the analysis of variance (Table 2), giving torch ginger flower extract solution up to 7.5% did not give significant effect (P > 0.05) to the mean percentage of head variable (8.26 ± 0.55%), neck variable (5.01 ± 0.66%) and shank variable (2.41 ± 0.19%). The results of the research done by Kharisma *et al*. [15] on Magelang ducks fed by commercial BR-1 ration had a head percentage of 5.25 ± 0.48%. Soeparno [16] suggested that the growth of the body component was indicated by the livestock's almost constant bone growth when the livestock experienced maturity. The mean percentage of neck in this research was 5.01 ± 0.66%, lower than Simanullang's [17] research on PMp ducks with a 6.45% neck mean percentage. The results of this research also showed the relatively similar states between the neck weight and the neck percentage because the genetic growth rate of the neck of ducks is just the same whether it

was given or was not given the ration or the treatment. Furthermore, giving torch ginger flower extract solution up to 7.5% did not give significant effect ($P > 0.05$) to the mean percentage of shank variable (2.41 ± 0.19%). The mean percentage of shank found in this research was lower than that of Dewanti *et al*. [18] at 2.68%. But, in general, the weight and percentage of the ducks' shank was almost the same because the shank was composed of many bones. Andoko [19] stated that the fastest growth was the bone growth and once it reached the maximum size, the bone growth would stop, the bone grows first because it is the framework that determines the formation of muscle. Moreover, Andoko [19] stated that bone was formed at the beginning of growth and was almost constant when the animals were getting mature.

The mean percentage of giblet (liver, gizzard, heart) and intestine can be seen in Table 3. In general, giving torch ginger flower extract solution up to 7.5% did not give significant effect to the variables of giblet and intestine.

Table 3. The Percentage of Giblet and Intestine of Local Male Ducks

Treatment	Giblet Percentage (%)			
	Liver	Gizzard	Heart	Intestine
R0	2.50±0.02	3.02±0.12	0.66±0.00	3.68±0.43
R1	2.07±0.66	2.80±0.25	0.69±0.03	3.52±0.22
R2	2.40±0.14	3.01±0.32	0.81±0.09	4.31±0.52
R3	1.83±0.23	2.70±0.43	0.71±0.15	4.18±0.35
Mean	**2.20±0.41**	**2.88±0.29**	**0.72±0.10**	**3.93±0.48**

Based on result of data analysis presented in Table 3, the effect was not significantly different ($P > 0.05$) to the mean percentage of liver (2.20 ± 0.414%). The results of this study were lower than the research done by Dewanti *et al.* [18] who found that the mean percentage of liver of local male ducks was 2.71%, but higher than Purba and Prasetyo's [20] findings where 12-week-old EPMp broiler duck fed with high crude fiber with 21% of protein content had a liver percentage of 1.90 ± 0.04%. Nevertheless, their research results were still in line with the opinion of Irham [21] stating that the range of liver percentage was 1.70-2.80% of the live weight. According by Andoko [19] stated that the weight of the liver would be affected by the body size and strain. In addition, liver weight was also affected by pathogenic bacteria that would lead to swelling liver.

The results of feeding the ducks with commercial food and torch ginger flower extract solution showed no significant effect ($P > 0.05$) to the percentage of gizzard. The mean percentage of the gizzard found in this research (2.88 ± 0.294%) was lower than Dewanti's [22] findings where 8-week-old Turi ducks had a mean percentage of gizzard of 4.74 %. This was in line with the opinion of Dharmawanti and Ari [23] stating that the increased weight of gizzard was not due to the increasing growth, but because of its quite heavy function in grinding the food into smaller

particles, so that the gizzard enlargement was greatly influenced by the number and the nature of roughness of its food ingredients.

Based on the results of data analysis presented in Table 3, the mean percentage of heart showed no significant difference (P>0.05) between the treatments. The mean weight of duck heart (0.72±0.096%) was lower than the mean weight (0.84%) found in the research done by Kurniawan *et al.* [24]. Similarly, the percentage of intestine also showed no significant difference (P > 0.05) between the treatments. Nevertheless, the average percentage of intestine in this research (3.93 ± 0.483%) was higher than that of Purba and Prasetyo [20] who found that feeding ducks with the ration containing 9% of crude fiber and 23% of protein resulted in the intestine percentage of 3.53 ± 0.14%.

Giving torch ginger flower extract solution up to 7.5% did not give a significant effect on all non-carcass variables. This shows that the giving of torch ginger flower extract solution was able to maintain the percentage of non-carcass parts of ducks so that it did not decrease the percentage of carcass parts of local male ducks.

4. Conclusion

Feeding the ducks with commercial food supplemented with TGE solution at levels up to 7.5% did not significantly affect the percentages of non-carcass parts in local male ducks. Treatment with TGE gave a positive effect in maintaining the percentage of non-carcass parts of local male ducks.

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Table 2. Percentage

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Mean44.06±2.038.74±0.638.26±0.598.26±0.595.01±0.662.41±0.19Notes: R0 = Co...

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