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THE INCLUSION OF PAPAYA LEAF JUICE IN DRINKING WATER ON THEGROWTH AND CARCASS OF BALI DUCKS (*Anas sp*.)

Ni Made Ayu Wira Dewi*[1], I. G. N. G. Bidura[2], N. W. Siti[2] and I. G. M. Rusdianta[3]

[1]Magister Program, Faculty of Animal Science, Udayana University, Denpasar-Bali, Indonesia.
[2]Faculty of Animal Science, Udayana University, Denpasar-Bali, Indonesia.
[3]Program Studi Agribisnis, Fakultas Sains dan Teknologi, Universitas Tabanan, Bali.

Corresponding Author: Ni Made Ayu Wira Dewi
Magister Program, Faculty of Animal Science, Udayana University, Denpasar-Bali, Indonesia.

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ABSTRACT

The purpose of this study was to examine the use of papaya leaf juice (PLJ) to increase growth and carcass of bali ducks. The experimental design used was a completely randomized design (CRD) with four treatments and five replications so that there were 20 units with 10 male Bali ducks with homogeneous body weight (46.04 ± 2.21 g). The four treatments were PLJ levels in drinking water, namely: 0%; 2%; 4%; and 6%, as treatment P0, P1, P2; and P3, respectively. The results showed that the growth performance of ducks given papaya leaf juice through drinking water at a level of 2-6% did not show any significant difference (P≥0.05). However, the inclusion of papaya leaf juice in drinking water significantly (P≤0.05) increased the percentage of carcass breasts meat. Based on the results of thestudy, it can be concluded that the inclusion of papaya leaf juice at a level of 2-6% in drinking water can increase the percentage of carcass breast meat in Bali ducks.

KEYWORDS: Breast meat, papain, growth, itik.

INTRODUCTION

Efforts need to be made to increase meat production, namely by developing the potential of local livestock.[1] One of the local livestock that has the potential to be developed is the Bali duck. Bali duck (*Anas sp*.) is one of the original Indonesian germplasm which is distributed in Bali.[2] Besides being used as production animals, Balinese ducks are also used as ritual animals, therefore Balinese ducks need to be preserved.[3] Bali ducks have a high adaptability, so they can be kept in various regions in Indonesia.[4] Bali ducks that are usually used as meat producers are male ducks. The advantages of male ducks compared to female ducks are: (i) cheaper seed prices; (ii) faster growth; and (ii) higher survivability. Nowadays, the selling price of duck meat is higher than that of broilers, and this is one of the reasons for the lower market share of duck meat.[5] The high selling price is due to the long growth and development of ducks, so the cost of maintenance is higher.

The old duck rearing system is one of the factors for the low cultivation and availability of duck meat. The duck meat available in the market and provided by several restaurants, mostly comes from young male ducks or rejected female ducks, so that the physical quality of the meat is not good, such as rough texture, tough with a distinctive meat aroma, namely a rancid smell. To get a high quality carcass, as well as tender meat, it is necessary to add a supplement to the ration.[3] One of the supplement ingredients that can be used to improve the quality of duck carcasses is papaya leaves.

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Supplementation of papaya leaf extract and lactic acid bacteria (LAB) in the diet did not affect the length and weight of the digestive tract in female Tegal ducks aged 22-30 weeks.[6] Siti et al.[7] found that the use of fermented papaya leaf extract in rations from 12-16% levels significantly increased water content, cooking loss, and decreased water holding capacity, but did not affect the pH of the meat. Utilization of papaya leaf extract at a level of 16% significantly reduced the color of the flesh, but had no effect on aroma, texture, taste,

and overall acceptance. The use of herbal leaves[7,8,9,10,11,12,13] can significantly increase growth and carcass quality, and reduce cholesterol content.

Based on these problems, this study was carried out to determine the effect of the inclusion of papaya leaf juice in drinking water to improve the performance and carcass of bali ducks.

MATERIAL AND METHODS

Animal treatments and experimental design

One day old (DOD) male Bali ducks were obtained from a local Bali duck breeding business in Tabanan Regency, Bali Province. The experimental design used was a completely randomized design with four treatments and five replicationsso that there were 20 units with 10 male bali ducks with homogeneous body weight (46.04 ± 2.21 g). Each cage plot was 200 cm long; width 15 cm; and 50 cm high. The cage plots were made of bamboo slats and wire. The four treatments were papaya leaf juice levels in drinking water, namely: 0%; 2%; 4%; and 6%, as treatment P0, P1, P2; and P3, respectively. All ducks were fed according to the ration recommended by the[14] with a crude protein content of 18% and a metabolized energy of 2900 kcal/kg. All rations were in the mash form and given twice a day, in the morning and evening. Likewise, drinking water was provided ad libitum.

The performance of Bali ducks, namely the initial weight and final weight. Weighing was carried out at the beginning of the study and at the end of the study. Body weight gain. Weighing was done every week. Body weight gain was determined by subtracting the final body weight from the initial body weight. **Feed Conversion Ratio (FCR):** The FCR calculation was carried out every week, namely the ratio between the amount of feed consumed and body weight gain. Consumption of feed and drinking water every day, calculated according to the consumption of feed or drinking water in each treatment.

Carcass characteristics: After slaughtering the body part in a halal manner, first the feathers were removed and the internal organs removed, without the head, neck, legs, lungs, and/or kidneys. **Physical composition of the carcass**: After obtaining the carcass, the next step was to separate the bone, meat, and subcutaneous fat including the skin from the carcass (physical composition of the carcass). Each weight component of the carcass was then divided by the weight of the carcass and multiplied by one hundred percent.

Preparation of papaya leaf juice: Papaya leaves are obtained from papaya plantations owned by farmers in Indonesia Baturiti District, Tabanan Regency, Bali Province. A total of 1 kg of fresh papaya leaves are crushed in 1 liter of clean water (v/v; g/g). Then crushed and allowed to stand for 12 hours at room temperature. Then filtered with a double cloth and put into a plastic bottle. Papaya leaf juice is ready to be mixed into drinking water according to the level of treatment (2 cc; 4 cc; and 6 cc in 100 cc of drinking water).

Commercial pieces of carcass: Obtained by cutting the body parts (comercial pieces from carcass) into 5 parts, namely the chest, upper thighs, lower thighs, wings, and back. Data were analyzed by one-way ANOVA. If there were results that are significantly different ($P \leq 0.05$) followed by Duncan's test.

RESULTS

In Table 1, the performance of male Bali ducks aged 0-8 weeks is presented with drinking water with papaya leaf juice supplementation. The inclusion of papaya leaf juice at the level of 2-6% in drinking water did not have a significant effect ($P \geq 0.05$) on final body weight (BW), live weight gain (LWG), feed consumption (FC), drinking water, and FCR.

Table 1: The effect of the inclusion of PLJ in drinking water on the performance of male bali ducks aged 0-8 weeks.

Variables	Level of papaya leaf juice (PLJ) in drinking water (%)				SEM
	0	2	4	6	
Final body weight, g	939.87	973.34	894.60	977.87	29.43
Body weight gains, g	893.47	926.74	848.67	931.40	29.45
Feed consumpsion, g	1970.23	1882.60	1905.98	1905.70	0.09
Drinking water konsumpsion, ml	8741.63	8602.78	8567.28	8537.30	17.97
FCR (FC:LWG)	2.21	2.03	2.25	2.05	38.05

Carcass percentages and carcass parts are presented in Table 2. The inclusion of papaya leaf juice or water extract in duck drinking water, turned out to have no significant effect ($P \geq 0.05$) on the percentage of carcass and carcass parts of ducks. There was a significant increase in the breast meat of the duck group that received PLJ. When compared with controls (without PLJ or P0), the percentage of carcass meat in groups P1, P2, and P3 ducks were: 10%, 20%, and 30% significantly ($P \leq 0.05$) higher than P0.

Table 2: The effect of the inclusion PLJ in drinking water on the carcass characteristics of male Bali ducks.

Variables	Level of papaya leaf juice (PLJ) in drinking water (%)				SEM
	0	2	4	6	
Carcass percentage, %	54.53	55.14	57.30	54.09	7.82
Carcass bone percentage, %	32.68	29.33	29.26	28.36	0.91
Carcass meat percentage, %	44.64	49.11	46.87	45.19	1.16
Carcass fat percentage, %	22.67	21.25	23.87	24.98	3.01
Thigh percentage, %	31.29	26.74	28.73	28.23	4.45
Wing percentage, %	18.13	18.62	17.29	17.84	3.89
Back percentage, %	29.88	30.83	30.20	31.78	3.76
Breast meat percentage, %	20.70b	23.81a	23.10a	22.14a	0.75

Note: a,b in one line significantly different (P≤0.05)

DISCUSSION

The inclusion of 2-6% PLJ in drinking water has no impact on the performance of the ducks. This is due to the low concentration of PLJ in drinking water. It was reported by[15] that the concentration of herbal extracts in drinking water, especially saponins, greatly affected the performance of poultry. The same thing was reported by[16] that saponins are proven to be efficacious as antimicrobials, and are strongly influenced by the concentration of administration. Restiayanti et al.[17] reported that giving herbal extracts to broilers did not have an effect on ration consumption, but could significantly increase body weight gain and feed efficiency. According to[18], the use of herbal flour through feed can reduce body weight, while feed consumption and feed use efficiency have no significant effect. So it is recommended that the use of herbal flour in feed is not more than 2% level. Contrary to the research results of[19] who received a significant decrease in feed consumption for chickens that were given herbal supplements compared to chickens that were not given supplements. Reported by[20] that Pennyroyal herbal supplement reduces feed consumption and feed efficiency in broilers.

The inclusion of papaya leaf extract in drinking water for ducks from 0-8 weeks of age did not significantly affect the carcass percentage and carcass parts of ducks. However, the inclusion of PLJ in drinking water significantly increased the percentage of duck carcass meat. The increase in carcass breast meat is inseparable from the role of phytochemical compounds contained in papaya leaves. The same thing was reported by[13] that the ration supplemented with herbal leaves (*Daucus carota*) did not affect the percentage of carcass, but significantly increased the percentage of breastmeat and also the protein mass of breast meat in ducks. Also reported by[10], supplementation of herbal leaf water extract in drinking water significantly increased carcass weight, and conversely decreased carcass fat percentage. Another thing that causes an increase in the percentage of carcass breast meat is because herbal leaves (*Moringa*) in feed can increase protein digestibility.[21] Also reported by[22,23] that supplementation of herbal mixtures into broiler feed significantly increased live weight and carcass characteristics of broilers, and the inclusion of sweet potato leaf meal in the feed could increase the protein mass and calcium of the meat.[24]

CONCLUSION

It was concluded that the inclusion of 2-6% papaya leaf juice in drinking water did not improve the growth and carcass of Bali ducks. However, it significantly increases the percentage of breast meat. It is necessary to increase the concentration of papaya leaf juice in drinking water to get optimal results.

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