Final Weight, Carcass Percentage and Abdominal Fat of Broiler Chickens Given Combined Mengkudu Leaf Flour (*Morinda citrifolia*) and Papaya Leaf Flour (*Carica papaya*)

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Abstract

The purpose of this study was to know of effect of substitution commercial feed with mengkudu (*Morinda citrifolia L*) leaf flour and pepaya (*Carica papaya L*) leaf flour combination in broiler chickens. The research use 60 day old chick of broilers which were devided into 4 treatments, that is T0 were given commercial feed without substitution, T1 were given commercial feed with substitution of *Morinda citrifolia L*. (1.5%) and Carica papaya L. (0.5%), T2 were given commercial feed with substitution of *Morinda citrifolia L*. (1.0%) and *Carica papaya L*. (1.0%) and T3 were given commercial feed with substitution of *Morinda citrifolia L*. (0.5%) and *Carica papaya L*. (1.5%). The variables observed final weight, carcasse percentage and abdominale fat percentage. The result of the study obtained that the final weight was 1286.67 (T0), 1398.00 (T1), 1361.33 (T2) and 1465.33 (T3), carcasse percentage 67.67 (T0), 69.58 (T1), 70.28 (T2) dan 69.24% (T3), and abdominale fat percentage 1.89 (T0), 2.00 (T1), 2.09 (T2) dan 1.95% (T3). The result of the analysis show an non significant in final weight, carcasse percentage and abdominale fat percentage. It could be concluded that substitution commercial feed with mengkudu (*Morinda citrifolia L*) and pepaya (*Carica papaya L*) leaf flour combination can't increase of final weight, carcasse percentage and abdominale fat percentage in broiler chickens.

Key word : commercial feed, mengkudu and pepaya leaves flour and economic analysis.

Introduction

Mengkudu (*Morinda citrifolia L*) and papaya (*Carica papaya L*) are one of the herbal plants that are often used in Indonesia. The utilization of these two herbs is not only in humans but also in livestock. Waha (2001) stated that the mengkudu plant has been used as medicine by the people of Southeast Asia. Syahruddin et al. (2011), stated that the provision of mengkudu leaf flour in poultry rations can reduce cholesterol levels of broiler chicken meat.

Mengkudu leaves contain protein, lime, iron, carotene and ascorbin. Darusman (2002) reported that the pharmacological effect of mengkudu leaf extract in vitro has anthielmintic activity, quite good against Ascaris lumbricoides worms in the intestine. (Apriyantono and Farid, 2002) reported that mengkudu leafs and roots contain anthraquinone compounds (damnacantal) which function as antiseptic, antibacterial, and anticancer. Mengkudu leaf also contain xeronine which is known to help absorb protein (Bangun and Sarwono, 2002). Mengkudu leaf flour contains 22.11% crude protein,

10.30% Ca, 437 ppm Fe, 35.80 ppm Zn and 161 ppm carotene (Wardiny, 2006). Mengkudu leaf also contain high active substances, namely steroids and tritepenoids. Wardiny (2006) who reported that the provision of noni leaf flour by 3-9% in the ration of laying hens did not have a significant effect on ration consumption. But Sangadji et al. (2005) reported that 15% mengkudu leaf powder in crumble rations could increase broiler ration consumption, while Bestari et al. (2005) stated that the provision of noni leaf flour soaked in hot water by 5-15% in the ration, significantly reduced the consumption of broiler chicken rations.

Papaya leaf (*Carica papaya L*) are medicinal plants because they contain alkaloid compounds and preteolytic enzymes, papain, chymopapain and lysozyme which are useful in the digestive process and facilitate the intestines (Khamarudin and Salim 2006). The protein content of papaya leaf is quite high, namely 21.89%. The protein content in papaya leaf is high enough so that it can be used as a constituent of rations. Papaya leaf also contain a lot of papain enzyme which has a function as a proteolytic enzyme so that it can increase the efficiency of the digestive process. Sutama (2008) stated that papaya leaf contain carotene which functions as provitamin A which can be used as a source of natural xanthophylls. Meanwhile, Ardina (2007) explains that papaya leaf contain papain enzymes which function as antimicrobials that can inhibit the work of several microorganisms and alkaloids that function as antibacterials. Papain can also function to help regulate amino acids and is able to remove toxins from the body. The active component of carotene (pro vitamin A) in papaya leaf can act as an antioxidant (Sutama, 2008). Kamaruddin and Salim (2000), papaya leaf contain alkaloid compounds and preteolytic enzymes. Papain is an enzyme that lyses proteins in their peptide bonds, especially loosening and breaking the bonds of the amino acids lysine and agrinin.

Materials and Methods

The research was conducted at the Akademi Peternakan Karanganyar, Bejen Village, Karanganyar District, Karanganyar Regency.

Research Materials and Tools

Research material

a. Ross strain broiler chicks produced by PT. Super Unggas Jaya aged 1 day (Day Old Chick: DOC) as many as 60 head, with an average body weight of 34.5 g/head.
b. BR-1 concentrate feed produced by PT. Japfa Comfeed Indonesia.
c. Leaf Flour and Papaya Leaf Flour.

Research tools

a. The group cage is 12 units.
b. Equipment, including scales.

Table 1. Nutrient content of basal feed, mengkudu leaf flour and papaya leaf flour (%)

No.	Nutrients	Basal Feed	Mengkudu Leaf	Pepaya Leaf
1	Dry matter (DM)	86-90 %	89.94 %	87.37 %
2	Crude protein (CP)	21-22 %	15.92 %	16.77%
3	Crude fat (CFat)	5-7 %	23.26 %	8.55%
4	Crude fiber (CF)	3-5 %	22.12 %	16.28%

Source : 1) PT. Comfeed Indonesia (2008)
2) Febriani (2010)
3) Widiyaningrum, (2000) ; Sudjatinah, (2005)

Table 2. Research Feed Composition

Feed ingredients	T0	T1	T2	T3
		--%--		
1. Concentrat	100	98	98	98
2. Mengkudu leaf flour	-	1.5	1	0.5
3. Papaya leaf flour	-	0.5	1	1.5
Research Feed Quality				
1. Dry matter (DM)	88.00	88.00	88.01	88.03
2. Crude protein (CP)	21.00	20.90	20.91	20.90
3. Crude fiber (CF)	4.00	4.33	4.30	4.27

Research methods

The method used in this study is an experimental method using a completely randomized design (CRD). 60 broiler chicks aged 1 day (Day Old Chick, DOC) were randomly divided into 4 treatment groups, and each treatment group consisted of 3 replicates with 5 chickens each. The treatment groups are :

1. T0 : The group of chickens fed commercial feed without a combination of mengkudu leaf flour and papaya leaf flour"
2. T1 : The group of chickens fed commercial feed with a combination of 2% of the basal ration of mengkudu leaf flour and papaya leaf flour consisted of 75% mengkudu leaf flour and 25% papaya leaf flour.
3. T2 : The group of chickens fed commercial feed with a combination of mengkudu leaf flour and papaya leaf flour" as much as 2% of the basal ration consisting of 50% mengkudu leaf flour and 50% papaya leaf flour.
4. T3 : The group of chickens fed commercial feed with a combination of ” Noni Leaf Flour and Papaya Leaf Flour” as much as 2% of the basal ration consisting of 25% mengkudu leaf flour and 75% papaya leaf flour.

Results and Discussion

The results of the study which included final body weight, carcass percentage and abdominal fat percentage can be seen in Table 2.

Table 3. Data on feed consumption, final body weight, carcass percentage and abdominal fat percentage

Parameter	Treatment			
	T0	T1	T2	T3
Final body weight (g/head)	1286.67	1398.00	1361.33	1465.33
Carcass percentage (%)	67.67	69.58	70.28	69.24
Percentage of abdominal fat (%)	1.89	2.00	2.09	1.95

Final Body Weight

The average final body weight of broilers until the age of 28 days for each treatment was 1286.67 (T0); 1398 (T1); 1361.33 (T2) and 1465.33 g/head/day (T3), with an average of 1377.83 g/head/day. The results of statistical analysis showed that the final body weight was not significantly different (P>0.05). This means that the replacement of commercial feed with a combination of mengkudu leaf flour and papaya leaf flour had no effect on the final body weight of broiler chickens. These results can be explained that the partial replacement of commercial feed with mengkudu leaf flour and papaya leaf flour has relatively the same nutritional content, namely T0 (CP = 21% and CF = 4.0%), T1 (CP = 20, 91% and CF = 4.27%), T2 (CP = 20.91% and CF = 4.30%) and T3 (CP = 20.92% and CF = 4.33%). The nutritional content is still within the standard requirements so that it gives the same effect on feed consumption. This is in accordance with the opinion of Faiq et al. (2013) which states that feed consumption is influenced by the content of food substances in feed, chicken health, environmental temperature, housing, feed containers and stress that occurs in the poultry.

Furthermore, with the same quality and quantity of feed for each treatment, it will result in body weight gain and the achievement of the same final body weight. This is in accordance with the opinion of Widodo (2009), which states that body weight gain is influenced by several factors, namely the quality and quantity of feed, type of chicken, sex, strain, management, environmental temperature, where the chickens are kept. Average daily body weight gain from each treatment, namely 44.69 (T0); 48.69 (T1); 47.39 (T2) and 51.08 grams/head/day (T3), with an average of 47.96 grams/head/day. The results of statistical tests showed that the increase in body weight was not significantly different (P>0.05). This means that the replacement of commercial feed with a combination of noni leaf meal and papaya leaf meal did not affect body weight gain.

Mengkudu leaf contain carotene, Fe, and Zn which make chickens grow faster so that it can increase body weight gain in broiler chickens. In addition, mengkudu leaf which are added to the ration have a greater role as herbal antibiotics. Mengkudu leaf also contain terpenoid active substances, anti-bacterial, scolopetin, anti-cancer, xeroline and proxeronin. Papaya leaf contain alkaloid compounds and proteolytic enzymes,

papain and chymopapain which are useful in the digestive process and facilitate the work of the intestines. However, the active substances present in mengkudu leaf flour and papaya leaf flour have not been able to affect metabolism because the levels used to replace them are still lacking. While in papaya leaves contain papain enzymes which have the same function as proteolytic enzymes, namely loosening peptide bonds in proteins, thereby increasing protein digestibility. However, the replacement of commercial feed with a combination of mengkudu leaf flour and papaya leaf flour at a level of 2 percent has not been able to increase body weight gain and final body weight.

Carcass Percentage

The percentage of broiler carcasses for each treatment was T0, T1, T2, T3 respectively 67.67; 69.58; 70.28 and 69.24%. The statistical test on the percentage of carcass showed that the results were not significantly different. This means that the replacement of concentrate with mengkudu leaf flour and papaya leaf flour does not affect the carcass. This was because the final body weight was the same between treatments (T0, T1, T2, and T3) resulting in the same carcass percentage. The final body weight of each treatment was 1286 (T0), 1398 (T1), 1361.3 (T2), and 1464.3 g/head (T3). Jiyanto and Santi (2019) stated that one of the factors that influenced the carcass percentage was live weight. This means that the carcass percentage is in line with the final body weight height and describes the occurrence of changes in growth and as a factor that affects live weight. Mugiyono et al. (1991) cited by Aziz (2002) stated that carcass weight was closely related to growth and final body weight. Iskandar (2005), stated that the percentage of carcass was influenced by feed consumption, type of feed, age, and live weight. This opinion is supported by Subekti et al. (2012) which states that the factors that affect the percentage of carcass are feed, and age.

Percentage of abdominal fat

The average percentage of abdominal fat for each treatment in succession was T0=1.89%; T1=2.00% ; T2=2.09%; T3=1.95%. The statistical test for the percentage of abdominal fat showed that the results were not significantly different ($P>0.05$). This means that the replacement of concentrate with mengkudu leaf flour and papaya leaf flour does not affect the percentage of abdominal fat. In this study, the final body weight did not differ between treatments, resulting in the same difference in abdominal fat.

This is in accordance with the opinion of Solichedi et al. (2003) which states that feed consumption can affect the fat content of broiler chickens and the less feed consumption, the lower the fat content. Meanwhile, feed consumption greatly affects the achievement of live weight. According to Jiyanto and Santi (2019), that one of the factors that influence the growth of abdominal fat is body weight, besides being influenced by gender, age, and body weight, where increasing body weight and increasing age causes abdominal fat weight to increase. The results of this study indicate the percentage value of abdominal fat ranges from 1.89 to 2.09% and is still within normal limits. Octaviana et al. (2010) stated that the abdominal fat in the chicken body is said to be excessive when the percentage of abdominal fat weight is more than 3% of body weight. Suparno (1992), which states that broiler chickens contain approximately 2-3% abdominal fat 15-20% of live weight.

Conclusion

Based on the results of the study, it can be concluded that the effect of replacing commercial feed with a combination of mengkudu leaf flour and papaya leaf flour up to a level of 2% has not been able to achieve final body weight, carcass percentage and abdominal fat percentage.

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