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NONI (MORINDA CITRIFOLIA) MEAL AS A BIOACTIVE COMPOUND FOR PERFORMANCE AND BLOOD PROFILE OF KAMPONG CHICKEN

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Abstract

This study aims to assess the use of Morinda citrifolia fruits (MCF) meal as bioactive compounds in Kampong chicken feeds. The MCF meals were added to the meals with the treatment as follows (in four replicates): R0: control feed, R1: 5 g MCF in 1 kg feed, R2: 10 g MCF in 1 kg feed, R3: 15 g MCF in 1 kg feed, R4: 20 g MCF in 1 kg feed, R5: 25 g MCF in 1 kg feed. This study used 288 chickens aged 8 weeks and were cared until 14 weeks aged. Morinda citrifolia fruits meal is safe to be use up to 25 grams per 1 kg of feed as bioactive substances in chicken rations. The use of MCF at level 20 and 10 gram per 1 kg can decrease cholesterol contain in Kampong chicken blood. However, the use of MCF did not decrease the content of Triglycerides, HDL and LDL. Aroma of chicken result of this research give same result with research of Kususiya (1978) but for flavors that taste slightly tasty, in contrast to the results Kususiya (1978) that is very tasty taste.

Key words: Morinda citrifolia, Kampong Chicken, cholesterol, Noni, Blood Profile

INTRODUCTION

Kampong chicken is native Indonesian chicken originating from red jungle fowl (*Gallus-gallus*) which has been domesticated and has a distinctive superiority of meat flavour and can adapt to the surrounding environment. In Indonesia, selling price of chicken meat and eggs of Kampong chickens is higher than others chicken.

Also, Kampong chicken is more resistant to disease and climate change compared to broiler chickens. According to Aman (2011), consumption of this Kampong chicken in Indonesia increased in 2001-2005 by 4.5% (1.49 million tons) and in 2005-2009 it increased up to 1.52 million tons.

Rusiana and Iswarawanti (2004) reported that 85% of broiler chicken meat in surrounding of Jakarta contained antibiotic residues such as tylosin, penicillin, oxytetracyclin and kanamycin with the highest percentage from penicillin derivate. Another report by Purwaningtyas and Cahyaningtyas (2004) was detecting chloramphenicol antibiotic residues in

liver and kidneys of rejected laying hens, in the District of Ponorogo.

Over-use of antibiotics can pose a risk to human health, namely with an emergence of bacteria that are resistant to antibiotics in livestock will move to humans if used continuously (Dawe, 2004; Rosen, 2004).

Noni is one of potential medicinal plants to be developed because it contains several useful substances, such as alkaloids, anthraquinonoid, flavonoids, tannins and saponins, so that it can be used to treat diseases caused by worms (Syamsuhidayat and Hutapea, 1991; Wijayakusuma et al., 1996; Murdiati et al., 2000; Heyne, 1987). Noni fruit flour can significantly reduce cholesterol levels of broiler chicken meat (Sujana, 2017 and Setyaningsih, 2011).

Noni fruit flour in poultry nutrition was expected to increase ration conversion and reduce mortality, so that it benefits farmers. Therefore, this research needs to produce

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healthy livestock products that are safe and free antibiotic residues.

MATERIALS AND METHODS

The research was carried out in a Completely Randomized Design. Six experimental diets were formulated (R0, R1, R2, R3, R4, R5). R0 (control) had zero inclusion level of dietary Noni fruit flour while treatments R1, R2, R3, R4 and R5 had 5, 10, 15, 20 and 25 g/kg inclusion of Noni fruit flour respectively. A total of two hundred and eighty-eight (288) aged eight (8) weeks old unsexed broiler chicken were used for the experiment, the birds were divided into six treatment groups with four replicates, each of 12 birds in a completely randomized design.

The variables observed in this study were:

1. Broiler performance included feed consumption, body weight gain, feed conversion and mortality.
2. Blood profiles included Cholesterol, Triglyceride, HDL dan LDL.
3. Organoleptic tests included general appearance, color, texture, aroma and taste.

KUB Chicken (Balitnak Superior Chicken) are used in this study. These chicken are bred from

local chicken developed by Balitnak. These chicken that has body weight range of 1,200-1,600 g (Balai Penelitian Ternak, 2012).

Data were analyzed by analysis of variance and significance between means was determined using Duncan's multiple range test (Steel and Torie, 1960).

RESULTS AND DISCUSSIONS

Effect of MCF on Kampong Chicken Performance.

The effects of using MCF as bioactive compounds in Kampong chickens rations can be seen in Table 1.

Table 1. Performance of Kampong Chicken

Variables	Treatments					
	R0	R1	R2	R3	R4	R5
Consumption	3181.5	3125.3	2956.5	2616.5	2915.0	3079.5
Weight gain (g)	399.5	414.0	377.2	444.67	340.1	326.5
Conversion	2.69	2.69	2.64	2.16	2.59	2.76
Mortality (%)	3	5	5	3	5	3

Results showed that treatments did not affect feed consumption of chickens. The average consumption during this study was 2616.5 ± 114.71 to 3181.5 ± 433.99 g (Table 1). No difference in ration consumption showed that the palatability of the rations was no different between treatments. Even though the tannin and saponin content in MCF is quite high, the dosage itself was too low so it did not affect palatability. The average body weight gain during the study was 326.45 ± 30.67 to 444.67 ± 67.92 grams per head. This indicated that MCF can be used in broiler rations. The average conversion rate during the study was 2.16 ± 0.12 to 2.76 ± 0.47 . The absence of the effect of giving Noni flour

had not been able to improve the efficiency of the rations. But ration conversion is better than that obtained by Gunawan and Sartika (2000) who reported that at crossing Pelung chickens and native chickens resulted in a ration conversion of 3.09.

In this study mortality occurred for all treatments with a range of 3 to 5%. Mortality is a very important factor for the success of chicken farming. The mortality in this study was not due to the use of MCF but because of the whole treatments. It is suspected that the chicken losses were caused by sudden death syndrome (SDS). According to Amrullah (2004) states that SDS arises due to metabolic disorders due to

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electrolyte imbalance in left ventricular fibrillation. SDS is marked by sudden death and the chicken slams down. This indicates that the use of Noni fruit flour in broiler rations did not

have a negative influence on the mortality of broilers.

Effect of MCF on Blood Chicken Profile

The effects of the use of MCF as bioactive compounds in rations on the blood profile of broiler chickens can be seen in Table 2.

Table 2. Blood Profiles of Kampong Chicken

Variables	Treatments					
	R0	R1	R2	R3	R4	R5
Cholesterol (mg/dL)	153.81 ± 9.58 ^{ab}	162.64 ± 14.34 ^b	143.68 ± 6.79 ^a	163.72 ± 6.18 ^b	142.16 ± 11.22 ^a	154.68 ± 10.18 ^{ab}
Triglyceride (mg/dL)	155.57 ± 21.91	160.89 ± 12.53	147.85 ± 22.64	157.09 ± 13.96	146.83 ± 19.87	161.01 ± 16.5
HDL (mg/dL)	83.75 ± 8.67	74.21 ± 7.74	85.05 ± 11.74	85.52 ± 10.94	83.21 ± 17.64	94.996 ± 16.59
LDL (mg/dL)	38.95 ± 8.8	56.25 ± 15.34	29.41 ± 13.16	46.78 ± 12.17	29.58 ± 19.26	27.48 ± 21.64

There were no significant differences in most blood measurements. Cholesterol mean during the study was 142.16 ± 11.22 to 163.72 ± 6.18 mg/dL. Ration R4 gave the lowest cholesterol content in the blood of 142.16 mg/dL, followed by R2 ration of 143.68 mg/dL, but not significantly different from the control ration R0. Also, the content of triglycerides, HDL and LDL for all treatments was not significantly different.

additive had no significant effect ($P>0.05$) on lipid profiles of blood and fatty acid composition of meat.

Effect of MCF on Organoleptics from Broiler Chicken Meat

The effect of MCF as bioactive compounds in ration of broiler chicken on organoleptic of the meat can be seen in Table 3.

Study using duck by Kurniawan et al (2015) showed that using noni fruit powder as feed

Table 3. Organoleptic Tests on Kampung Chickens

Meat Traits	Treatments					
	R0	R1	R2	R3	R4	R5
Color	1.83	2.83	2.78	2.52	1.52	2.00
Texture	2.39	1.87	2.22	2.39	2.86	3.04
Aroma	1.91	2.48	2.50	2.09	2.24	2.23
Taste	2.09	2.30	2.43	2.22	2.48	2.74

The results of the panellists' assessment of the organoleptic tests showed that the color scores ranged from 1.52 to 2.83 which were pale to slightly bright with the highest score at R1 ration and the lowest at R4 ration. As for texture, the score ranges from 1.87 to 3.04, which is rather rough to slightly smooth texture. The highest score for the texture of 3.04 is for the R5 ration and the lowest for R2 ration. While for aroma, the score ranged from 1.91 to 2.50, which is a rather fishy and not fishy aroma. This is the same as the results obtained by Kususiyah

(1978) who get the aroma of free-range chicken which is less and not fishy. For taste, the scores obtained ranged from 2.09 to 2.74, which were rather savoury and savoury. This result is different from what Kususiyah (1978) found, which is very tasty.

CONCLUSIONS

Morinda citrifolia fruits (MCF) was safe to use up to level 25 g/kg as a bioactive compound in livestock rations. The use of MCF at level of 20

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g/kg and 10 g/kg can reduce cholesterol levels in the blood of broiler chickens, but does not reduce the content of triglycerides, HDL and LDL.

MCF can improve color and texture of chicken meat, also can reduce fishy odour and make chicken meat more savoury.

Chicken meat results from this study provide the same results as Kususiyah's research (1978), but for the taste obtained is only a rather savoury and savoury taste, different from the results of Kususiyah (1978), which is very tasty taste.

Further study need to be conducted to find the optimum level of MCF on ration for Kampong chicken.

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