

## Short Communication: Growth performance, and blood profile of kampong chicken fed diets containing *Moringa oleifera* powder and liquid

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**Abstract.** Adli DN. 2020. *Short Communication: Growth performance, and blood profile of kampong chicken fed diets containing Moringa oleifera powder and liquid.* Asian J Agric 4: 83-86. The research purpose is to carry out the possible effect of *Moringa oleifera* on Growth performance, and intestinal properties of Lohmann broiler. 80 one-day-old kampongs were randomly allocated to 4 dietary treatments and 4 replicates of 5 birds per cage. Four treatments used for research were dietary with control (T0), basal diet + *M. oleifera* 80 g (T1), Drinking water + 2 mL/L *M. oleifera* (T2), and basal feed + *M. oleifera* 80 g+ drinking water 2 mL/L *M. oleifera* (T3). The results showed that using *M. oleifera* presented no significant difference ( $P < 0.05$ ) on body weight gain at 1-35 days and intestinal properties. The microstructure didn't affect negatively to its structure. In conclusion, addition of *M. oleifera* does not impact growth performance, and but can reduce amount of glucose in kampong chicken.

**Keywords:** Blood biochemistry, Kampong chicken, performance

### INTRODUCTION

Intensive poultry production systems demand a supply of high protein- and easily available in developing countries. However, during the last decade, dietary protein sources for livestock have become tremendously expensive and difficult to access, challenging researchers and farmers globally to seek alternative protein sources and increase the quality and availability of alternative livestock feeds (Adli et al. 2018).

Consequently, various forage trees and shrubs have been explored as potential protein sources, and special attention has been paid to the tree *Moringa oleifera*. *M. oleifera* were substances that provide a source of antioxidant for animals. The source of antioxidant was later called natural growth promoters (Adli et al. 2017).

Originating from the Indian sub-continent. *M. oleifera* is reputed for its adaptability to grow in all types of soils and to tolerate hot and dry conditions (Jet et al. 2014). The antibiotics are provided as a growth promoter; however, they cause bacterial resistance and residue in the carcass. Alternative feed additives, such as *M. oleifera*, have been the focus of many studies during the past five years due to their beneficial effect on feed efficiency. *M. oleifera* replaces the use of antibiotics because they are safer and act as a natural growth promoter (NGPs) in kampong chicken (Adli et al. 2018).

*Moringa oleifera* was a potential for natural growth promoters. The moringa can be used as feed additive in terms of non-nutritional value of poultry additive. (Jet et al. 2014). It contains negligible amounts of antinutritional factors, has a high crude protein (CP) content, significant amounts of vitamins A, B, and C in the foliage, and high

amounts of polyphenols, resulting in significant anti-oxidative activity. *M. oleifera* is also called a miracle tree, since it provides a lot of chemical properties on its leaf. *M. oleifera* are economical trees that grow in tropical areas (Su and Chen 2020). *M. oleifera* acts as anti-bacterial, anti-oxidant, and anti-inflammatory (Auriem et al. 2019).

### MATERIALS AND METHODS

#### Animals, housing, and experimental design

A total of 80 kampong chickens with initial body weight (BW) of  $22.13 \pm 2.13$  kg were used in an 8-weeks trial. Treatments were as follows with control (T0), basal diet + *M. oleifera* 80 g (T1), Drinking water + 2 mL/L *M. oleifera* (T2), and basal feed + *M. oleifera* 80 g+ drinking water 2 mL/L *M. oleifera* (T3). The house is set with temperature of 29°C and 65% humidity. Furthermore, it was set to 23 hours of light and 2 hours of darkness. Feed nutrients can be seen in Table 1.

#### Growth performance

The kampong chickens were individually weighed at the beginning of the experiment, and every week thereafter until the end of the experiment. The gain in body weight (BWG) of birds per week was calculated as the difference between the initial and end weight at a given week (7 days, 14 days, 21 days, 28 days, and 35days). Feed intake was calculated basis of feed offered and remain. As basis mortalities set calculated during experimental.

**Table 1.** Experimental diet

Feed nutrient	Starter (1-28 days)	Finisher (29-56 days)
Maize	57.11	69.66
Dehulled soybean meal	36.53	26.65
L-Lysine	0.1	0.1
DL-methionine	0.55	0.55
Dicalcium phosphate	1.67	1.55
Limestone	1.13	1.02
Salt	0.3	0.3
Soy oil	2.81	0.06
Vitamin premix*	0.05	0.05
Mineral premix**	0.05	0.05
Choline	0.1	0.1
	<b>100.4</b>	<b>100.09</b>
Dry matter (%)	87.00	87.00
ME (Kcal/kg)	3050	3150
Ash (%)	9.00	9.00
Crude protein (%)	22.00	18.00
Fat (%)	6.00	6.00
Crude fiber (%)	3.00	2.50
Ca	1.00%	0.95%
P	0.70%	0.75%
Copper (ppm)	30	50
Zinc (ppm)	120	120

### Blood biochemistry

Blood data was taken at 21, 28, and 56 days of age. The blood non-EDTA tubes and allowed to clot for one hour, at room temperature, Blood samples were immediately centrifuged using the cryogenic centrifuge (Hettich Universal 320R, Germany) for 15min at 3000 rpm to obtain serum and further: glutamic oxaloacetic transaminase; GPT: glutamic pyruvic transaminase; TP: total protein, ALB: Albumin; GLB: globulin; A/G: albumin/ globulin ratio; TGL: triglyceride; TCHOL: total cholesterol; BUN: blood urea nitrogen; GLC: glucose (Adli, et al. 2019).

### Data analyses

Data were statistically analyzed using GLM procedure of SAS University version 4.0 red hat (64-bit) with code encryption algorithm <http://localhost:10080/SASStudio/38/index> license owned by Danung Adli and the difference among treatment means ( $p < 0.05$ ) were determined using Duncan's multiple range tests. Code algorithm in SAS as follows:

```
Data Q1;
Set pre.Q1;
Run;
Proc ANOVA data=Q1;
Title 'one-way anova with a Moringa oleifera on one factor';
Class calib;
Mode shape_1shape_2 shape_3 shape 4= calib/nouni;
(Widiyawati 2020).
```

## RESULTS AND DISCUSSION

### Growth performance

Data on comparison *M. oleifera* leaf and liquid in feed is shown in Table 2. Giving Red *M. oleifera* leaves and liquid doesn't improve ( $p > 0.05$ ) on FI, FCR, and BWG. The feed intake increase may be due to correlating with body weight and body weight gain when both of these variable growth increase the feed intake will also increase. Compared with Adli and Sjoftan (2020) who stated that the use of MRF gave significant difference ( $P < 0.05$ ) on body weight gain at 21 d and 35 d compared than control (877 g (MRF 400 g/tonne (21 d); 50 g/tonne (35d)) vs 819 g control). The result is due to the rearing condition, the kampong chicken will increase the body weight gain when the environment bedding is clean (Adli and Sjoftan 2020). Additionally, the bodyweight of poultry would be determined by the consumption of feed with a balanced energy and protein content. In the past, the use of plants in monogastric diets was restricted because of some negative aspects of feed intake and nutrient utilization attributed to phytochemical composition that varies greatly due to variety, location, and climate. The mortality result in Table 2 showed the use of MRF combination with probiotic liquid acidifier on treatment (T2 and T3) gives no significant differences ( $P > 0.05$ ) reduces to 1.31% compared to control 3.94%. In earnest, the effect on growth performance may not be consistent, for instance, in several cases where plant extracts have been used, FI and FCR were not changed, although a positive effect on BW, BWG, organ weight, and/or energy utilization was reported (Sjoftan et al. 2019).

Statistical analysis of the meat quality is presented in Table 3. Shows *M. oleifera* leave and liquid in feed on the on-serum blood biochemistry were not significantly different ( $P > 0.05$ ) but the results on Glutamic oxaloacetic transaminase (GOT) at 21 days began to reduce. The treatment was better compared to control (219.20 (T1), 200.10 (T2), and 215.30 (T3) vs. 243.30 U/L). Melesse et al., (2017) stated the criteria GOT were at the number less than 40 U/L. The result of the GOT may be due to *M. oleifera* content. Ogbe and Affiku (2020) stated *M. oleifera* may reduce content of anti-stress substances. The dietary treatment of feed additives depends on dose, frequency, and time rearing in vivo (Adli and Sjoftan 2020).

Based on Table 3, the use of *M. oleifera* was not significantly different ( $p > 0.05$ ) on total protein. In the beginning, it is hard to reduce but more stable compared to control. Moreki and Gabanakgosi (2014) stated *M. oleifera* can't help to reduce total protein in a short amount of time in animals, but it will help with longer amounts of time.

The result may be due to the treatment that cannot help to reduce the amount of blood content on the heart. The serum of blood biochemistry was indicator of positive or negative results of treatment. (Sjoftan et al. 2019). Factors that affect heart weight are broiler body weight, age, broiler activity, and gender. Banjo (2012) stated the high fiber of *M. oleifera* made the additive stay more in intestinal of chicken. To reduce crude fiber, it needs to be reduced in the fiber with liquid content of substances (Sjoftan et al. 2019).

**Table 2.** Effect of *Moringa oleifera* on the body weight, body weight gain, feed intake, feed/gain, and mortality of kampong chicken

Day	Treatments <sup>1</sup>				SEM
	T0	T1	T2	T3	
Bodyweight, g/bird					
1	33.12	33.15	33.15	33.08	0.11
28	421.33	412.13	404.39	405.12	17.40
48	888.11	825.11	720.2	713.102	17.40
56	889.12	883.12	812.11	715.15	10.40
Bodyweight gain, g/bird					
1-21	674.64	670.05	671.98	668.98	42.55
1-28	1001.12 <sup>b</sup>	1138.73 <sup>a</sup>	1128.63 <sup>a</sup>	1192.09 <sup>a</sup>	47.70
28-48	1525.10	1537.10	1574.70	1486.90	65.20
1-56	1856.90	1842.70	1878.40	1786.60	167.20
Feed intake, g/bird					
1-21	909.80	979.10	855.40	807.30	21.06
1-28	1874.60	2018.40	1822.90	1727.80	53.70
28-48	2264.70	2414.40	2273.40	2102.00	70.00
1-56	2668.60	2810.80	2690.10	2499.00	76.80
Feed/gain, g/bird					
1-21	1.33	1.49	1.22	1.22	0.09
1-28	1.73	1.72	1.54	1.44	0.23
28-48	1.52	1.58	1.54	1.49	0.37
1-56	1.48	1.54	1.50	1.44	0.14
Mortality, (%)					
1-56	5.94	2.26	2.26	2.26	2.26

Note: Mean values not sharing the same superscripts in a row differ significantly ( $P < 0.05$ )

**Table 3.** Effect of *Moringa oleifera* on the serum blood biochemistry kampong chicken at 56 days of age

Item	Treatments <sup>1</sup>				SEM
	T0	T1	T2	T3	
GOT (U/L)	219.20	200.10	215.30	243.30	121.1
GPT (U/L)	3.00	1.75	2.00	2.75	0.97
TP (g/dL)	2.97	2.97	2.92	2.95	0.29
ALB (g/dL)	1.27	1.27	1.17	1.22	0.16
GLB (g/dL)	1.70	1.70	1.77	1.70	0.18
(A/G)	0.77	0.77	0.67	0.72	0.11
TGL (mg/dL)	32.25	30.25	30.50	29.00	5.66
TCHOL (mg/dL)	128.50	128.75	114.50	123.50	12.38
BUN (mg/dL)	0.97	0.47	0.62	0.47	0.32
GLC (mg/dL)	251.00	205.00	213.75	227.00	29.10

Note: Mean values not sharing the same superscripts in a row differ significantly ( $P < 0.05$ )

Based on Table 4, the use of *M. oleifera* was not significantly different ( $p > 0.05$ ) on total cholesterol, blood urea nitrogen, and glucose. Compared to control, TCHOL was at 114.50 (T2) and 123.50 (T3) with SEM 12.38. The total cholesterol was at the same time lower with glucose due to surface area of *M. oleifera*. The key absorption was spread to blood area of body (Sjofjan et al. 2020). Additionally, to Abdulsalam et al. (2015), *M. oleifera* is much better to provide antioxidant compared to other leaves.

In conclusion, addition of *Moringa oleifera* does not impact growth performance, and but can reduce amount the amount of glucose in kampong chicken.

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