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RESPONSE OF BROILER CHICKENS TO THE INCLUSION OF *MAHKOTA DEWA* (*Phaleria macrocarpa*) LEAF MEAL IN RATION

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ABSTRACT

The study was conducted at Poultry Laboratory Department of Animal Husbandry Faculty of Agribusiness and Food Technology Djuanda University, Bogor from October to November 2004.

The study was aimed at assessing the effects of Mahkota Dewa (Phaleria macrocarpa) leaf meal inclusion in the ration on feed intake, body weight gain, feed conversion, carcass and giblet percentages of broiler chickens. A completely randomized design was used. Treatments consisted of basal rations with Mahkota Dewa leaf meal inclusions of 0% (control, R0), 0.1% (R1), 0.3% (R2), and 0.5% (R3). Rations were given to unsexed broiler chickens of Hybro strain.

Results showed that no significant differences (P>0.05) were found in all parameters measured.

Keywords : *Phaleria macrocarpa leaf meal, animal medicine, chicken performance.*

INTRODUCTION

In addition to feed management, control of disease is an important aspect in broiler chicken rearing. Administration of animal medicine and antibiotic has been a common practice in modern broiler chicken industries. Antibiotic is commonly included in commercial chicken feeds. This is done to avoid and treat several diseases, shorten feeding period, and minimize death loss (Gentili, 2008). However, the use of antibiotics in chicken feeds has been a major world concern because of at least two reasons. Overuse of antibiotics may lead to reduced ability of those antibiotics to cure infections. In addition, long-term use of antibiotic in food-producing animals may result in the accumulation of antibiotic residue in animal products that will eventually give adverse effects on consumers' health. In advance countries including Australia, France, and Switzerland, therefore, the use of antibiotic in animal feeds has been banned (Third World Network, 2009).

Efforts have been done to explore more natural ways of controlling diseases. Awareness on the utilization of herbal medicines with less negative effects on human's health is improving. *Mahkota Dewa* (*Phaleria macrocarpa*) is an Indonesian traditional plant that has received much attention from scientists for its medicinal properties. It has been used traditionally to threat various diseases including cancer, hypertension, heart disease, diabetes, etc. The fruit and leaf have medicinal properties but the seed is poisonous. The medicinal properties of *Mahkota Dewa* fruit and leaf are attributable to their chemical constituents including

saponin and flavonoids which are known to have immune enhancing and antioxidant activities. Medicinal benefits of *Mahkota Dewa* on human health have been extensively studied and reviewed (e.g. Harmanto, 2004; Triastuti and Choy, 2008; Wijayakusumah, 2009).

Based on the above notion, it is reasonable to assume that the chemical constituents of *Mahkota Dewa* fruit and leaf bring medicinal benefits to animal health. The immune enhancing and antioxidant activities contained in *Mahkota Dewa* plant could make this plant a potential source of natural antibiotic supplementation in animal feed (Zainuddin, 2006). However, information on the use of *Mahkota Dewa* leaf meal in commercial chicken feed is still limited.

MATERIALS AND METHODS

The study was conducted at the Poultry Laboratory Department of Animal Husbandry, Faculty of Agribusiness and Food Technology, Djuanda University, Bogor.

Fourty-eight of one-day old chickens of Hybro strain with homogenous initial live weight were allocated into 16 pens (3 chickens/pen). Basal ration was formulated by using a Feedmania program to contain 22.5% crude protein (CP) and 3150 Kcal/kg metabolizable energy (ME) as given in Table 1. A completely randomized design with four replications in each treament was used. Chickens were fed basal ration and *mahkota dewa* leaf meal was given as feed additive in the following rates: 0% *mahkota dewa* leaf meal (R0, control), 0.1% *mahkota dewa* leaf meal (R1), 0.3% *mahkota dewa* leaf meal (R2), and 0.5% *mahkota dewa* leaf meal (R3). Basal ration was given for 4 weeks while *mahkota dewa* leaf meal was given in the last 2 weeks. Before being given to the chickens, *mahkota leaf* was collected, chopped, dried in 60-70°C, and then ground. Common commercial chicken management practices including vaccination were done to ensure that the chickens grew to their potential growth rate.

Measurements were taken on feed intake (FI), body weight gain (BWG), feed conversion (FC), carcass weight and the percentages of liver weight and heart weight to live weight. BWG (g/chicken) was the difference between final body weight and initial body weight. Total feed consumed and feed remains were recorded during the feeding period to obtain FI data. FI was then compared with BWG to obtain FC data. MR was the number of dead chickens in the end of the trial in proportion to initial total number of chickens raised. The percentages of carcass and visceral part weight were the weight of the part in proportion to chicken's live weight at the end of the trial. Data were subjected to an analysis of variance according to Gome and Gomes (1990). Mortality rate during the trial period was also recorded.

Table 1 Basal ration's composition week 1-4

Feedstuff/nutrien	%
Rice bran	20.00
Corn	45.15
Fish meal	18.23
Soybean meal	10.00
Bone meal	0.67
$CaCO_3$	1.2
Pemix	0.5
Palm oil	3.45
CP	22.5
ME (Kcal/kg)	3150

RESULTS AND DISCUSSION

Results of the study are shown in Table 2. There was no significant difference (P>0.05) was found in all parameters. However, there was a tendency that treated chickens had better performance than untreated ones seen from the parameters measured. Feed intake tended to increase with higher percentage of *mahkota dewa* leaf meal inclusion. The highest average feed intake was found in R3 (1,858 g/chicken). However, this figure was still lower than that (2156 g/chicken) found by Scott (1982) in broiler chickens in 4 week rearing period. This less figure might be caused by the all mash form of feed given in this study. It is well known that chickens naturally prefer crumble feed.

It was shown in Table 2 that body weight gain was not significantly (P>0.05) different. This might be caused by the same nutritive contents of basal ration. However, body weight gain of chickens treated with *mahkota dewa* meal tended to be higher. The average body weight gain of untreated chickens was only 697 g/chicken while that of chickens treated with 0.5% mahkota dewa meal was 945 g/chicken. This phenomenon was in line with what was found by Zainuddin (2006) that, in general, the use of herbal medicines did not directly increase body weight gain but improved feed efficiency. In this study, this was proven by the finding that feed conversion of treated chickens had a tendency to be higher than that of untreated ones. However, this feed utilization (1.81 in R2) was still less efficient than that (1.47) found by Scott (1982).

No difference was either found in carcass percentage, liver weight percentage, or heart weight percentage. Treated chickens, however, tended to have higher caracass percentage (67.65% in R2 *vs.* 63.55% in control). Result of this study was not in accordance with that of Zainuddin (2006) who concluded that the use of herbal medicine might improve carcass quality by reducing abdominal fat. Meanwhile, liver weight percentage tended to lower in treated chickens. Liver takes role in neutralization of toxins in the body. Over detoxification occuring in liver increases liver size. The liver size of treated chickens (2.47% in R2) that tended to be smaller than that of control chickens (2.82%) might indicate lower detoxifiation process. This might me induced by the inclusion of *mahkota dewa* leaf meal. Herbal medicines inclusion in chicken drinking water or feed improves the animal's health (Zainuddin, 2006). Indeed, the figures of chicken liver sizes in this study (2.47-2.85%) were still under the normal ranges of 1.8-2.7% (Togatorop, 1988). The effect of mahkota dewa leaf meal on the chicken health was also indicated by the heart size. No dilated heart was found in this study indicating that *mahkota dewa* leaf meal inclusion in chicken feed did not impaired chickens' health although no difference was found between treatments. Chicken heart sizes in this study (0.93-1.09%) were found to be under the normal ranges of 0.50-1.42% (Resang, 1984).

Tabel 2 Average feed intake, body weight gain, feed conversion, carcass percentage, liver weight percentage, and heart weight percentage

Replication	Treatment			
	R0	R1	R2	R3
Feed Intake (g/chicken)				
1	1,109	1,403	1,966	1,789
2	1,806	1,615	1,417	1,511
3	1,548	1,320	1,658	2,071
4	1,450	1,236	1,669	2,064
Average	1,478±2.50	1,393±1.41	1,517±.1.95	1,858±2.31
Body weight gain (g/chicken)				
1	565.0	651.9	1,170.0	920.0
2	842.2	891.6	710.8	790.0
3	720.0	676.7	748.3	1,013.0
4	661.6	531.6	918.3	1,058.0
Average	697±116	678±150	886±206	945±118
Feed conversion				
1	1.96	2.15	1.68	1.94
2	2.14	1.81	1.99	1.91
3	2.15	1.95	2.21	2.04
4	2.19	2.32	1.81	1.95
Average	2.11±0.10	2.05±0.22	1.92±.0.23	1.96±0.06
Carcass percentage (%)				
1	64.29	63.15	58.06	66.67
2	58.06	66.67	65.00	64.00
3	65.00	64.67	75.00	69.59
4	66.67	43.75	72.72	66.67
Average	63.55	59.56	67.65	66.75
Liver weight percentage (%)				
1	3.01	2.75	1.95	2.65
2	2.54	2.97	2.40	2.24
3	2.80	2.72	2.65	2.62
4	2.93	3.15	2.88	2.87
Average	2.82	2.85	2.47	2.55
Heart weight percentage (%)				
1	1.42	2.30	0.78	0.96
2	0.65	1.08	1.20	0.88
3	0.75	0.99	1.05	0.86
4	0.93	0.93	1.34	1.11
Average	0.93	1.08	1.09	0.95

Note: P>0.05 for all parameters

CONCLUSION

No inclusive differences were found on all parameters measured. However, there was a tendency that treated chickens had better performance than untreated ones. The inclusion of mahkota dewa meal did not impaire chickens' performance. Further studies on the utilization of mahkota dewa meal in higher rates is recommended.

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