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Application of Herbal Solutions on The Performance of Male Laying Chickens

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ABSTRACT

The purpose of this study was to determine the effect of giving herbal solutions [betel and binahong] on the performance of male laying chickens. The materials used were 96 male chickens aged 2 weeks. Completely Randomized Design [CRD] with four treatments and six replications were used in this research. The treatments were: R0: drinking water without betel and binahong leaf solution, R1: Drinking water + 20 ml betel leaf solution/l , R2: drinking water + 20 ml binahong leaf solution/l, R3: drinking water + a combination of 10 ml of betel leaf and binahong solution/l. The variables measured were feed intake, water intake, weight gain and feed conversion ratio. The results of the study showed that the treatments had no significant effect [P>0.05] on all observed variables. Thus it can be concluded that the administration of of betel and binahong leafs solution with a level of 20 ml/l and their 10% combination in drinking water has not been able to improve the performance of male laying chickens.

Keywords: male laying chickens; performance; betel leaf; binahong leaf

INTRODUCTION

Since the discovery of antibiotics as growth promoters for livestock, their use in rations and drinking water has greatly affected the appearance of poultry. However, the use of antibiotics has been reduced and even banned in several developed countries. Several studies have been conducted to replace the role of antibiotics as antibacterial, by using feed additives derived from medicinal plants.

Results of studies showed that betel [Piper betle L.] and binahong [Anredera cordifolia Ten.] leafs solutions had antibacterial and anti-oxidant activity which were useful for health and could improve livestock performance.

Betel leaf is generally known to the public as a traditional medicinal ingredient. As with antibiotics, betel leaf also has antibacterial properties. This ability is due to the various substances contained therein. Betel leaf contains 4.2% essential oil, most of which consists of Chavicol paraallyphenol, a derivative of Chavica betel. Isomers Euganol allypyrocatechine, Cineol methyl euganol and Caryophyllen, kavikol, kavibekol, estragol, terpinen [Sastroamidjojo et al., 2001].

Binahong is a fast-growing herbal plant in humid and cold areas, so it has great potential to be developed in tropical climates such as in Indonesia. One part of the binahong plant which is very useful is it leafs, because they contain several active chemical compounds that are useful for health. The active compounds found in binahong leaf are flavonoids, alkaloids, terpenoids, and saponins.

According to Shabella [2013] the active compounds of flavonoids act as antibiotics by interfering with the function of microorganisms such as bacteria and viruses, the pharmacological activity of flavonoids is as an anti-inflammatory, analgesic, and antioxidant. Alkaloid compounds function to inhibit the growth of gram-positive and gram-negative bacteria. Saponins play a role in the digestive process by increasing the permeability of the cell walls in the intestine and increasing the absorption of nutrients. Low levels of saponins in the ration will increase the transport of nutrients between cells. Terpenoid compounds also play a role in the digestive process, namely by stimulating the excretory nervous system, thereby releasing gastric juice which contains the enzymes amylase, lipase, trypsin, and pepsin. The use of these two kinds of herbs is expected to improve the performance of male laying chickens.

MATERIALS AND METHODS

This study used male laying chickens strain MB 502, produced by PT. Multi Breeder Surabaya aged 2 months. The chickens were placed in 12.50 m x 5.00 m housing which consisting of 24 plots with sized 100 x 80 cm. Chickens were fed commercial feed SB11 produced by PT. Charoen Phokphan [Table 1]. Provision of feed and drinking water is done ad-libitum.

TABLE 1: Nutritional Content of SB11 Rations.

Ingridients	Nutritional content [%]
Water	13 max
Protein	21.00-23.00
Fat	5.00 min
Fiber	5.00 max
Ash	7.00 max
Calcium	0.90 min
Phosphor	0.60 min

Source: PT. Charoen Phokphan.

The treatments were:
R0: drinking water without treatment (control)
R1: drinking water + 20 ml of betel leaf solution/l of water
R2: drinking water + 20 ml of binahong leaf solution/l of water
R3: drinking water + a combination of 10 ml of betel leaf and binahong leaves solution/l of water.

Variables measured were feed intake, water intake, body weight gain, and feed conversion ratio. The method used in this study is an experimental method using a Completely Randomized Design. The data obtained by this study were processed by Analysis of variance. Duncan's Multiple Range Test was applied to determine the effect of differences between treatments [Steel and Torrie, 1993]

Research procedure
The process of making betel and binahong leaves solutions

1. Air-dried betel and binahong leaves are weighed as much as 60 grams.
2. Each leaf is boiled in 300 ml of water for ± 20-30 minutes at 60°C.
3. The solution of the leaves is cooled and filtered.

RESULTS AND DISCUSSION
The Effect of treatments on feed intake, water intake, body weight gain and feed conversion ratio of Male Laying chickens were presented in Table 2.

TABLE 2: Average Feed Intake, Water Intake, Body Weight Gain and Feed Conversion Ratio.

Variables	Treatments			
	R_0	R_1	R_2	R_3
Feed intake (g/head/d)	75.90	78.12	76.10	76.23
Water intake (ml/head/d)	154.59	151.15	151.26	152.53
Body weight gain (g/head/d)	24.19	25.18	24.78	24.96
Feed conversion ratio	3.14	3.10	3.07	3.05

FEED INTAKE
The results of the analysis of variance showed that the use of betel, binahong leaves at a level of 20 ml/l and their 10% combination in drinking water had no significant effect [P>0.05] on the feed intake of male laying chickens. This shows that treatments did not affect the intake of the chickens. There was no effect of treatments it was suspected that the saponins and terpenoids tended to be unstable during the boiling process because they easily evaporated.

According to Wahyudi et al., [2015] terpenoid compounds improved digestion proses by stimulating the excretory nervous system, thereby secreting gastric juice containing the enzymes amylase, lipase, trypsin, and pepsin which are excreted into the stomach and intestines. These enzymes function as catalysts in the process of hydrolyzing starch, dextrin, and glycogen into maltose. In addition, these enzymes function to break down fats, proteins, and peptones [Habibah et al., 2012]. The process of optimizing the digestion of fat and starch resulted in a lower tendency for hunger, which had an impact on feed intake. Besides that, saponin compounds contained in binahong leaf extract are thought to reduce consumption of chicken rations because the taste of saponin compounds tends to be bitter.

WATER INTAKE
The results of the analysis of variance showed that giving a solution of betel, binahong leaves at a level of 20 ml/liter and 10% of their combination in drinking water had no significant effect [P>0.05] on drinking water consumption of male laying chickens. The absence of treatment effect showed that up to the limit of 20% solution of the two types of leaves and their combinations did not affect the level of water consumption. This means that the bitter taste of saponin compounds can be tolerated by chickens. According to Suparjo [2015] the bitter nature of saponins affects the level of water consumption, so that chickens tend to consume drinking water slightly lower than controls, as a result if this goes on for a long time the chickens can experience anorexia. Herbal solutions are also thought to not affect the water consumption of male laying chickens.

BODY WEIGHT GAIN
Statistical analysis results showed that administration of betle, binahong leaves solutions at a level of 20 ml/liter and their combination in drinking water had no significant effect [P>0.05] on body weight gain of male laying chickens. This proves that the treatment does not affect body weight gain.

The increase in body weight which was not significantly different was related to the amount of chickens feed intake. During the treatment the chickens consumed relatively the same rations, because the health status of the chickens was relatively the same between treatments and under normal conditions. This is in accordance with the opinion of Rasyaf [2011] which states that feed intake related to the entry of a number of nutrient elements into the body of the chicken. The higher the amount of intake, body weight gain will increase, conversely if the value of intake is low, the resulting product will also decrease.

Even though statistically there was no significant difference, numerically it was seen that the body weight gain of the animals that received all treatments was higher than the control treatment. Cheeke [2001] reported that the use of plants containing saponins or saponin extracts in ruminants or non-ruminants (monogastric) was reported to improve livestock quality and production. This is because saponins work as an anti-bacterial by interfering with the stability of the bacterial cell membrane. In addition, saponins also have properties such as foam (soap) which can clean the material attached to the intestinal wall. A clean intestine will facilitate the absorption of large molecules in the body and an increase in nutrients deposited in the body, thus affecting body weight gain [Francis et al., 2000].

FEED CONVERSION RATIO
Variance analysis showed that giving a solution of betel , binahong leaves at a level of 20 ml/l and their 10 % combination in drinking water had no significant effect [P>0.05] on the feed conversion ratio of laying type rooster. This was due to the relationship between the amount of feed intake and the value of body weight gain which was not significantly different.

This is in accordance with the opinion of Rasyaf [2011] that the feed conversion value is affected by body weight gain resulting from one unit of ration consumed. It was suspected that the chickens were in a good health status, lead to relatively same amount of intake between treatments, resulting in considerably same growth. Feed consumed will be used for the formation of cells and body tissues. These cells and body tissues are the basic substance for livestock growth [Wahju, 1992].

In addition, it is suspected that the anti-bacterial compounds in herbal solutions, namely saponins and terpenoids, are reduced during the boiling process so that they cannot balance the number of pathogenic and non-pathogenic bacteria in the digestive tract which decrease the digestion and absorption of nutients. This in line with the report by Etha et al [2015] that do to the long storage time saponin compounds in binahong solution has not been able to clean the digestive tract from pathogenic bacteria, thereby reducing the absorption of food substances which impact on the value of feed conversion ratio.

CONCLUSION

It was concluded that giving a solution of betel , binahong leafs at a level of 20 ml/l and 10% of their combination in drinking water was not able to improve the performance of male laying chickens.

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