

# Dietary Supplementation of *Andrographis Paniculata* Nees Meal on Performance and Serum Cholesterol of Laying Hen

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## Abstract

*Andrographis paniculata* (sambiloto) is well known as medicinal plant and use as supplement in the poultry ration. The objective of this research was to evaluate the effect sambiloto meal as feed additive in the diet on performance and serum cholesterol in laying hen. Thirty six of laying hens were used in this experiment. The basal diet contained 16 % crude protein and 2850 kkal/kg metabolizable energy. Completely randomized design was used in this experiment with four treatments and three replications (3birds/replication). The treatment were basal diet as control or basal diet + 0.3 g, 0.6 g, 0.9 g sambiloto meal/ kg live weight of laying hen, respectively. The parameters observed were feed consumption, hen day production, egg weight, feed conversion, mortality, triglyceride, HDL, LDL, and total cholesterol in serum. The results showed that the diet with 0.6 g sambiloto meal/kg live weight of laying hen significant ( $P<0.05$ ) increased of feed consumption and hen day production but was not influence on egg weight and feed conversion ratio. The sambiloto meal significantly ( $P<0.05$ ) reduced total serum cholesterol and LDL on level 0.9 g sambiloto meal/ kg live weight of laying hen.

**Keywords:** *Andrographis paniculata*, cholesterol, laying hen, performance, sambiloto

## Introduction

*Andrographis paniculata* is known as medicinal plant and use as supplement in the poultry ration. *A. paniculata* has many kind of names, such as Sambiloto, Ki Oray, Ki Peurat Bidara Sadilata, Sambilata, Takila, Ampadu and Pepaitan (Hanan, 1996). The *A. paniculata* is available and spread enough throughout the Indonesia. The active compound of *A. paniculata* are andrografid and neoandrografolide (Santa, 1996). Andrografolide have the effect as imunostimulan and antibacteria (Puri *et al*, 1993). The concentration of andrografolie was varies depending on the area for example in Bogor, Sukabumi and Sukaharjo are 1.92 %; 1.96% and 2,1%

respectively. The leaf extract of *A. paniculata* contain a noticeable amount of total phenol (5.96 mg/g) which play a major role in controlling antioxidant (Prakash S. *et al*, 2011). A mixture of *Andrographis* and mengkudu (*Morinda citrifolia*) extract given through drinking water produced body weight gain and feed efficiency better than the control (Zainuddin, 2003).

## Materials and Methods

### *Animals and Housing*

Thirty six laying hens 33 weeks of age with average  $1401.4 \pm 103.3$  g of body weight were used in this experiment. The experiment were conducted for 7 weeks and all chicken were reared in layer cages.

### *Experimental Diet*

Basal diet contained 16 % crude protein and 2850 kkal/kg metabolisable energy. All chickens were fed and water drinking *ad libitum*. Basal diet was supplemented with *A. paniculata* meal: 0.3 g, 0,6, 0,9 g/kg body weight. The nutrient composition of *A. paniculata* meal was presented in Table 1.

### *Andrographis paniculata Meal*

*A. paniculata* leaf were collected from local area. The leaves of *A.paniculata* was sun-dryer, powdered and kept ready for experimental used.

### *Design of Experiment*

Completely randomized design was used in this experiment divided into four treatments and three replications. The treatments were basal diet + 0.3 g *A.paniculata* meal/kg BW, basal diet + 0.6 g *A. paniculata*/kg BW, and basal diet + + 0.9 g *A. paniculata* meal/kg BW. Parameters observed were feed consumption, hen day production, egg weight, feed conversion rasio (FCR), triglyceride, HDL, LDL, and cholesterol total in serum. The feed ingredient and nutrient composition is presented in Table 2.

Table 1. The nutrient composition of *A. paniculata* leaves meal

Nutrient	Composition (%)
Moisture	88.01
Crude protein	11.03
Crude fiber	22.75
Ether extract	3.04

Table 2. Ingredients and chemical composition of the the layer ration in the experiment

Feed Ingredient	Total (%)
Yellow corn	56.75
Rice bran	11.4
Pollard	2
Fish meal	6
Soybean meal	14.5
Coconut oil	1.5
DCP	0.25
CaCO <sub>3</sub>	7.6
Chemical composition :	
Metabolisable energy (kkal/kg)	2900
Crude protein (%)	16
Calsium (%)	3.3
Phospor non Phytat (%)	0.34
Lysin (%)	0.89
Methionin (%)	0.33

### Collection and Analysis of Data

The collected data were analysed using analysis variance procedure and Duncan's Multiple Test was used to compare differences between treatmen means. The data on daily feed consumption, egg production and egg weight and feed conversion ratio were calculated. Serum cholesterol triglyceride, HDL, LDL were collected at laying hen 40 weeks of age

### Results and Discussion

The feed consumption, hen day production, egg weight and FCR are shown in Table 3. The results showed that hen fed 0.6 g *A. paniculata* meal per kg BW significantly ( $P < 0.05$ ) increased in hen day production as compared to other treatments. But hen fed 0.3 and 0.9 g per kg BW had lower feed consumption and hen day production than control. This was due to increase the feed consumption but FCR did not significant. The andrografolide active substance caused growth regulator (increased appetite), which can increase the consumption of nutrients for egg formation. *A. paniculata* had the effect of imunostimulan and antibacteria (Puri *et al.*, 1993) was caused performance at hen fed 0.6 g *A.paniculata* meal highest. Ulfah (2006) also reported that mechanism of active substance medicinal plant was affects as appetite stumulating substance, digestion enhancers, bacterial steering agents,

Table 3. Mean values of feed consumption, egg production, egg weight, and FCR for layer

Parameters	Treatment groups			
	P1	P2	P3	P4
Feed consumption g/bird/day	73.91±32.8 <sup>b</sup>	69.82±56.08 <sup>a</sup>	89.81±38.80 <sup>a</sup>	70.19±74.64 <sup>b</sup>
Hen day production %	37.3±4.73 <sup>b</sup>	42.47±9.47 <sup>b</sup>	62.38±2.32 <sup>a</sup>	43.09±1.71 <sup>b</sup>
Egg weight g/egg	53.45±2.50	50.23±3.38	48.96±5.84	46.58±7.21
Feed conversion ratio	3.54±0.45	3.57±0.49	3.72±1.39	3.51±0.20

P1= basal diet, P2= basal diet + 0.3 g/ kg BW, P3= basal diet + 0.6 g/ kg BW, P4= basal diet + + 0.9 g/ kg BW.

Table 4. The effect of *A. paniculata* meal in laying diet on triglyceride, HDL, LDL and cholesterol total serum

Variable	Treatment			
	P1	P2	P3	P4
Triglyceride mg/100 ml	124.11±4.69	109.20±11.72	135.20±8.51	124.80±16.74
HDL mg/100 ml	52.17±2.11	52.64±7.49	53.84±3.65	43.62±4.38
LDL mg/100 ml	79.06±5.46 <sup>bc</sup>	84.19±11.62 <sup>c</sup>	68.6±4.62 <sup>ab</sup>	65.79±3.02 <sup>a</sup>
Total cholesterol mg/100 ml	168.89±7.82 <sup>b</sup>	183.4±17.25 <sup>c</sup>	160.08±7.10 <sup>ab</sup>	143.87±4.29 <sup>a</sup>

P1= basal diet, P2= basal diet + 0.3 g *A. paniculata* meal/kg BW, P3= basal diet + 0.6 g *A. paniculata* /kg BW, P4= basal diet + + 0.9 g *A. paniculata*/kg BW.

metabolic modifiers, odour neutralizing component on regulating of performance health condition of animals. Mathiavan *et al.* (2006) reported that *A. paniculata* was use 2 g/kg was gave positif response on performnace of broiler chicken.

The hen fed 0.9 g *A. paniculata* meal per kg BW significantly ( $P<0.05$ ) decreased serum cholesterol total and LDL as compared than other treatments (Table 4). It showed that andrografolide play a role in lowering fat absorption. Nugroho (2001) reported that mice fed extract of *A. paniculata* at 160 mg/100 g body weight for 8 weeks decreased of cholesterol total but increased of HDL. But the result of this experiment showed that of serum LDL and HDL were decreased. Therefore, *A. paniculata* meal can used to prevent atherosclerosis at level 0.9 g/kg BW.

## Conclusion

Dietary supplementation of *A. paniculata* meal at 0.6 g per kg BW was effective to increased egg production. *A. paniculata* meal at 0.9 g per kg BW in ration was effective to decreased serum total cholesterol and LDL.

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