

## Addition of *Coleus Amboinicus*, L Leaf's Extract in Ration to Percentage of Carcass, Abdominal Fat, Liver and Heart Broiler

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**Abstract.** The purpose of this study was to determine the effect of giving *coleus amboinicus*, L leaf's extract, on the percentage of carcass, liver, heart and abdominal fat and the level of *coleus amboinicus*, L extract which is appropriate in broiler feed. This research was conducted in labor and broiler enclosures of the Payakumbuh State Agricultural Polytechnic, from January to May 2018. The material was DOC, commercial food 311, corn, bran, soybean meal, fish meal and minerals, and the equipment used was cages and equipment. The design used is RAL with 6 treatments and 4 replications. The results obtained that the addition of *coleus amboinicus*, L extract, L did not affect significantly ( $P > 0.05$ ) on the percentage of carcass and liver, while the administration of *coleus amboinicus*, L leaf's extract significantly affected ( $P < 0.05$ ) on the percentage of heart and abdominal fat broiler. Giving a dry of *coleus amboinicus* leaf's, L, 4 g / kg ration can reduce broiler abdominal fat.

**Keywords :** *coleus amboinicus* leaf's extract, liver, carcass, heart

### 1. Introduction

The addition of feed additives in broiler feed is one way to improve feed efficiency and to stimulate growth. Additive feeds that are often added to feed are compounds that have a function as a growth factor / promoter or fish factor. The compounds are antibiotic groups such as monensin, zinc-bacitracin, chlorotetracycline and so on at the sub-therapeutic level [1]. However, the addition of antibiotics is now a problem because residues that are still left behind in livestock products are consumed by humans.

The use of antibiotics has long been opposed by the European Union so that it has been established on January 1, 2006 (based on regulation no. 1831/2003) a milestone in the elimination of various types of antibiotic use in feed, for decades antibiotics are substances that are often used by farmers in various parts of the world . Some of the European countries, prohibiting the use of antibiotics in rations is actually not a new thing. Sweden in 1986, Denmark in 1995 and Switzerland in 1999 have restricted the use of additives in animal feed. The use of antibiotics in feed as a growth promoter compound can no longer be denied that there has been an increase in farmers' income due to the ability of these compounds to convert nutrients in feed efficiently and effectively. Addition of antibiotics as feed additives in rations has become a major topic of discussion for scientists, sometimes there is intense debate due to the adverse effects of consuming animal products containing antibiotics in animal feed due to residues left on both eggs, milk and meat.

The discovery of microbial resistance in livestock product residues (meat and eggs), as a result of giving antibiotics both in rations and in drinking water has inspired the search for natural alternative products to replace commercial antibiotics. Microbial resistance can move from livestock to the human body, through direct human contact with livestock or indirectly through consumption of animal products and food ingredients that are preserved with antibiotics. In the human body, bacteria will colonize and can cause various health problems, even death. One plant that can function as a natural antibiotic is *Coleus amboinicus* L (bangun-bangun).

*Coleus amboinicus* is a type of plant that has soft trunk, is not woody or only contains very little wood tissue, so that at the end of its growth it dies to the base without any part of the trunk left above the ground. *Coleus amboinicus* leaves, L also has various properties such as can overcome fever, influenza, cough, constipation, inflammation, bloating, canker sores, headaches, allergies, diarrhea and increase milk [2].

*Coleus amboinicus* contains the active compound thymol which functions as an alternative antibiotic, besides that it also contains calvacrol compounds which are known as anti-inflammatory and anti-inflammatory compounds,  $\alpha$ -terpinene compounds and  $\gamma$ -terpinene which function as antioxidants. Overall, *Coleus amboinicus* leaves function as pharmacoseutic compounds that function as buffering, antibacterial, antioxidant, lubricating, plasticizing, coloring and stabilizing compounds [3]. To get the active compounds contained in a plant can be done by extraction method, namely the method of extracting water and extracts with ethanol.

The results of the extraction of *Coleus amboinicus* leaves, L from water and ethanol, can be mixed in feed ingredients as an additive feed which is expected to increase the efficiency of rations and animal health in the presence of active compounds contained in the leaf. Nutrients can be absorbed by the intestine so that it can accelerate the metabolic process in the broiler body which can be seen from the carcass weight, the percentage of internal organs from the broiler.

The research objectives are 1) to determine the effect of giving *Coleus amboinicus* leaf extract extracted with solvent of hot water and 96% ethanol to the percentage of broiler carcasses and physiological organs ; and 2) to determine the level of administration of *Coleus amboinicus* leaf extract which is optimal in the ration on the percentage of broiler carcasses and physiological organs.

## 2. Experimental Method

### 2.1. Tools and material

This research was carried out at UPT Laboratory and Farm Animal Husbandry of the State Agriculture Polytechnic Payakumbuh for 4 months from January to May 2018. Research Material in this study, 96 broilers aged 1 week were used. *Coleus amboinicus*, L (bangun-bangun).

Table 1. Chemical composition of *Coleus amboinicus* leaves, L

Chemical Composition	<i>Coleus amboinicus</i> leaf (%)
Water content	15,44
Dry weight	84,56
Crude protein	19,24

Rough fat	4,21
Crude fiber	9,08
Ash	11,34
Calcium	2,133
P	0,312
GE (Kkal/g)	4070,51

The solvent used for maceration of wake-up leaves is aquades and 96% ethanol technically. The ration used is self-stirring rations with protein content of 21.5% - 22% with an energy content of about 3000 Kcal / kg. The ingredients of the ration are corn, fish flour, fine bran, soybean meal, minerals, oil and colamox).

*Coleus amboinicus*, L leaf, DOC broiler, ethanol, aquades, starter phase feed (up to a week) and mixed feed (corn, fish meal, soybean meal, rice bran, coconut oil and premix) and chemicals for nutrition analysis, plastic, waring, lime, disinfectant.

The cage of the stage floor made of small units with the size per unit is 70 cm x 100 cm for broilers. Complete distillation apparatus, evaporator tools, 2.5 liter size bottles, food and drink containers, scales, plastic containers, analysis kits, rough fiber analysis, vacuum pumps, furnaces, magnetic stires, calorimeter bombs, refrigerators, ovens, incubator, autoclave, spectrophotometer, broiler production cages, digital scales, 10 kg capacity scales.

## 2.2. Research Implementation Procedure

The study begins with the manufacture of leaf extracts of the buildings with different solvents and different methods.

### Ethanol extract method

Leaves that have been sliced are then dried to dry until dry. After drying the leaves of the wake are smoothed in a blender, and macerated by using 96% redistillation ethanol solvent for 3 days in a light protected place while stirring 4 times a day (maceration of simplicia with 96% ethanol done 3 times). The maceration method is the simplicia extraction process using a solvent with several times of shaking or stirring at room temperature. Technologically including extraction with the principle of the method of achieving concentration on balance. Kinetic maceration means continuous stirring. Remaseration means repeating the solvent enhancer after the first filter is filtered, and so on. The extract obtained is filtered. The extract obtained was evaporated with a rotary evaporator, so that a thick extract was obtained. The thick extract is then evaporated by using a water bath to remove the solvent. The extract results were dried at 50 °C for 36 hours. Then the extract obtained was stored in a refrigerator temperature of 4 – 8 °C.

### Water extract method

Leaves that have been sliced are then dried to dry until dry. After drying the *coleus amboinicus* leaves and blend into flour. The flour obtained is then boiled at 90 °C for 20 minutes, where the ratio of the leaves to wake-up with water is 1: 5. After that the decoction results are blended and filtered. Extraction is done twice. The filter results were dried at 50 °C for 36 hours.

The study consisted of 6 treatments, namely:

A = Control (without extracting)

B = Control (250 mg tetracycline / 5 kg ration)

C = 4 g of water extract from the *coleus amboinicus* leaves / kg ration

- D = 8 g of water extract of *coleus amboinicus* leaves / kg ration
- E = 4 g of ethanol extract of *coleus amboinicus* leaves / kg ration
- F = 8 g of ethanol extract of *coleus amboinicus* leaves / kg ration

Table 2. Composition and nutritional content of treatment rations based on calculations

feed ingredients	A	B	C	D	E	F
Yellow corn	48	48	48	48	48	48
Rice bran	1	1	1	1	1	1
soybean meal	37	37	37	37	37	37
Fish flour	5	5	5	5	5	5
oil	3	3	3	3	3	3
Mineral	1	1	1	1	1	1
Yellow noodle waste	5	5	5	5	5	5
Total	100	100	100	100	100	100
Water extract	-	-	4 g/1kg	8 g/1 kg	-	-
Ethanol extract	-	-	-	-	4 g/1 kg	8 g/1 kg
Tetracyclin	-	250 mg/5kg	-	-	-	-
Crude protein	22,139	22,139	22,139	22,139	22,139	22,139
Rough fiber	3,4173	3,4173	3,1473	3,1473	3,1473	3,1473
Fat	3,9081	3,9081	3,9081	3,9081	3,9081	3,9081
Ca	0,8504	0,8504	0,8504	0,8504	0,8504	0,8504
P	0,5912	0,5912	0,5912	0,5912	0,5912	0,5912
Metabolic energy	3058,9	3058,9	3058,9	3058,9	3058,9	3058,9

Note: Based on the analysis of the chemical laboratory of the State Agricultural Polytechnic Payakumbuh (2017) and the calculation based on the content of the ration material.

Chickens are kept for a one-week adaptation period by providing commercial feed and from the age of 8 days chickens are fed a mixture of feed consisting of corn, rice bran, fish meal, soybean meal, minerals, and coconut oil given until harvest (age 35 days). The provision of *Coleus amboinicus* leaf extract in feed begins with the age of 2 weeks of chicken which functions as an additive feed. Feed is stirred every week, at the end of the week we weigh the remaining feed. The composition of feed ingredients as shown in Table 1.

At the end of the study, 1 broiler for each treatment unit was cut and calculated the carcass weight and weight of internal organs such as liver, heart, abdominal fat. The results of the study will be analyzed ANOVA and if significantly different will be tested further by Duncan's Multiple Range Test.

### 3. Results and Discussion

Effect of Treatment on Percentage of Carcass, Liver, Heart and Abdominal Fat. The average percentage of carcass, liver, heart and abdominal fat broiler studies at five weeks as shown in Table 3.

Table 3. Average percentage of carcass, liver, heart and abdominal fat broiler aged 5 weeks

Treatment	Carcass (%)	Liver (%)	Heart (%)	abdominal fat (%)
A (control)	66,65	2,25	0,59a	1,66c
B ( control+ <i>tetracycline</i> )	65,26	2,62	0,49b	1,95d
C (4 g water extract/ kg ration)	65,02	2,42	0,43c	1,33a
D (8 g water extract/ kg ration)	65,05	2,87	0,57a	1,52bc
E (4 g ethanol extract/ kg ration)	65,78	2,26	0,48b	1,58c
F (8 g ethanol extract/ kg ration )	66,33	2,23	0,41c	1,40ab

Note: Different letters in the same column show real differences ( $P < 0,05$ )

#### Carcass

The Giving of leaf extracts in the building had no significant effect ( $P > 0.05$ ) on the percentage of carcasses. This means that the administration of *Coleus amboinicus* leaf's extract in the ration did not affect the percentage of broiler carcasses. This is in accordance with [4], that carcass production is closely related to body weight and broiler carcass size is sufficient, this difference is caused by body size, obesity level and the level of trafficking attached to the chest. *Coleus amboinicus* leaves contain essential oil which aims to increase appetite and can improve the digestive tract, but by giving 4 g / kg of feed and 8 g / kg of feed, *Coleus amboinicus* leaf's extract in feed has not been able to give optimal effect on the weight of broiler carcasses.

The content of the active substance in water extracts and ethanol of *Coleus amboinicus* leaves such as essential oils, thymol and carvacrol can inhibit the growth of *Escherichia coli*, namely microbes that have negative effects on livestock that can cause diarrhea so that the digestive and absorption of nutrients become more perfect and can improve digestive tract. The lactogogue compound consists of several components which when working together in the body will improve digestive function and increase body weight growth, while some of these compounds are 3,4-dimethyl-2-oxocyclopent-3-enylacetic acid, monomethyl succinate, phenylmalonic acid, cyclopentanol, 2- methyl acetate and methylpyro, glutamate, sterol compounds, steroids, fatty acids and organic acids [3].

The average percentage of carcasses obtained at five weeks is 65.68% with a range of 65.02 - 66.65% of life weight. The average percentage of carcass obtained by other

researchers is 68 - 71.8% [5], 56.64% -60.02% [6], 68.02 - 71.03% [7], 67-68% [8]. The percentage percentage obtained in this study is not much different from other researchers, this difference is due to the different feed ingredients that have an impact on the growth rate and body composition produced especially in the carcass produced. There is a difference in the percentage of broiler carcass produced because the ingredients of the ration compiler feed are different even though the protein ration content is almost the same, which can affect the growth rate and body composition which includes the distribution of carcass weight and components. Nutritional factors, age, and growth rate can affect the carcass weight composition and the percentage of carcass which usually increases with increasing life weight of chickens [9]. Carcass production is not only caused by the cut weight produced but also by handling the cutting process [10].

#### Liver

Statistical test results showed that the administration of *Coleus amboinicus* leaf's extract in feed had no significant effect ( $P > 0.05$ ) on the percentage of liver. In terms of percentage of liver by giving water extract of *Coleus amboinicus* leaves 8 g / kg in feed higher than the control and other treatments.

There is no difference in effect because the liver does not experience signs of poisoning and antinutrients due to the addition of water extracts and ethanol extract of *Coleus amboinicus* leaves. According to [11] that if the liver is poisoned, the color of the liver will turn yellow. Next, [12], states that the liver plays an important role in the body because it has several functions, namely bile secretion, fat metabolism, protein and iron metabolism, producing bile, detoxification function. The process needs to be done to get rid of toxins and waste from metabolic products. Cells and organs can carry out the detective process properly if they are in good health. In a weak state, cells are increasingly damaged by toxins [8].

The average percentage of broiler liver aged 35 weeks from the results of this study was 2,23 – 2,87% of the body weight of broiler life with an average of 2,44% of the weight of life, the percentage of liver obtained was enough to meet the standard. According to [13], the percentage of broiler liver ranged from 1,7 to 2,8% of life weight. Percentage of liver obtained between 2,15 – 2,59% [14]. The results of research by [15], the percentage of liver 2,21% in broilers aged 35 days who were given noni juice in rations. While the results of research by [8], the percentage of broiler liver aged 35 days with *Ocimum basilicum* giving in the ration was 1,98-2,3%.

The physiological functions of the liver are bile secretion to emulsify fat, neutralize toxins, store energy that is ready to be used by glycogen and decompose the residual protein into uric acid to be released by the kidneys. Toxic compounds will undergo a detoxification process in the liver [16]. Excessive toxic compounds cannot, of course, be completely detoxified, which causes damage and swelling to the liver.

#### Heart

Statistical test results showed that the administration of *Coleus amboinicus* leaf's extract had a significant effect ( $P < 0.05$ ) on the percentage of heart. The percentage of broiler heart was lower without giving *Coleus amboinicus* leaf's extract in feed than without giving *Coleus amboinicus* leaves. The low percentage of heart treated with water extracts or ethanol from *Coleus amboinicus* leaves in feed causes the heart muscle to not contract excessively because the feed does not contain toxins or anti-nutrition substances. [17] states that the heart organ is very susceptible to toxins and anti-nutrition substances found in the ration, in the heart that is infected by diseases or toxins there will be an

enlarged heart size. Furthermore, according to [18], the heart is very susceptible to toxins and antinutrients, heart enlargement can occur due to accumulation of toxins in the heart muscle. Factors that affect the percentage of heart are the type, age, size and activity of the livestock. The heavier the heart, the flow of blood entering and exiting becomes smoother, and affects the metabolism in the body of the animal [12]

#### Abdominal fat

Statistical test results showed that the administration of *Coleus amboinicus* leaf extract significantly ( $P > 0.05$ ) on the percentage of abdominal fat. The administration of *Coleus amboinicus* leaf extract can reduce broiler abdominal fat levels. The lowest percentage of abdominal fat is treatment C (water extract 4 g / kg ration). The percentage of abdominal fat depends on ration consumption, the more consumption of ration will increase abdominal fat because the excess energy consumed will be stored in fat form, *Coleus amboinicus* leaf extract can reduce the percentage of abdominal fat in the body. The highest percentage of abdominal fat was obtained in treatment B (positive control was administration of tetracyclin antibiotics in feed).

The percentage of abdominal fat in this study, including normal, ranged from 1,33 to 1,95% with an average of 1.57% of life weight, the percentage of abdominal fat obtained was sufficient to meet the standard. [19] states that the weight of abdominal fat usually ranges from 2-2,5% of carcass weight. According to [20], another factor that influences body fat content is the composition of the ration. Excess energy in the chicken's body will be stored in the form of fat, while the metabolism of fat formation requires a lot of energy, indirectly there is a waste of ration energy, while abdominal fat accumulation is included in the follow-up, is energy scattering and carcass weight reduction, because the fat discharged at processing time. Abdominal fat is one component of body fat, which is found in the abdominal cavity [21].

Abdominal fat is fat found around the intestine extending to the ischium, around the fabricus and abdominal cavity. Abdominal fat is a commonly observed part of assessing fat content associated with consumer tastes [22]. [23] states that broilers tend to store fat when energy use is inefficient and for a long time. Broiler maintenance in the tropics will produce abdominal fat 2.85% of life weight at 6 weeks. Excess energy will be stored in the form of fat, fat is stored in the body so that broilers will look fat, accumulation of fat will increase after broiler chickens enter the final period, because after the peak of body weight gain at the age of 4 weeks increased fat increases, fat accumulation will increase intensive if broilers are less mobile. The percentage of broiler abdominal fat ranged from 0.73 to 3.78%. Abdominal fat and carcass fat have a positive correlation, when abdominal fat increases, carcass fat will also increase [24]. The results of the research by [25] stated that there was no effect of giving ginger at the level of 1%, 2% and 3%, to the level of abdominal fat ( $P > 0.05$ ). [26], reported that the results of their study had no effect on the administration of herbal additive feed variants in broilers in five weeks broiler maintenance on abdominal fat content ( $P > 0.05$ ). The fat produced in the study has a weight of 1,15-1,52%.

#### 4. Conclusions

Based on the results of the study can be concluded administration of *Coleus amboinicus* leaf's extract in the ration had no significant effect on the percentage of carcass and liver while the heart and abdominal fat had a significant effect. Thus, the best

extract of *Coleus amboinicus* leaf's extract is 8 g of ethanol / kg extract ration on the percentage of the heart while the percentage of abdominal fat is 4 g of extract of water / kg of ration. The administration of *Coleus amboinicus* leaf extract in the form of water extract and ethanol extract to the percentage of carcass and liver can be tolerated up to 8 g / kg ration.

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