

The Content of Cholesterol, Fat, Vitamin A and E in the Meat, Liver, and Eggs in Japanese Quails Given Katuk Leaves Extract in the Diet

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Abstract

*Katuk leaves extract (*Sauropusandrogynus L. Merr*) is a medicinal plant that has been studied because it has many benefits. Katuk leaves in animal feed can be used in the form of meal and extract. The advantages of Katuk Leaves Extract (KLE) in the diet are easy to store, need in a relatively small amount and low fiber content. This experiment was conducted using one hundred fifty six female Japanese quails starting at 4 weeks old and raised uptill 10 weeks of age. The parameters observed were the content of cholesterol, fat, vitamin A and E in the meat, liver, and eggs. The treatments were control diet (R0); control diet with 0.15% KLE (R1) and control diet with 0.30% KLE (R2). The quails were divided into 3 treatment groups with 4 replications (13 quails in each replicate). The data of quail performances were analyzed by a completely randomized designed and further with Duncan's test if there were any significant differences in the treatments. The data of the cholesterol, fat, vitamin A and E in the meat, liver, and eggs were analyzed descriptively. The advantages of giving KLE in quails' diet were decreased the content of cholesterol, fat in the liver and eggs, and increased the vitamin A and E content in the meat and eggs.*

*Keywords: cholesterol, katuk (*Sauropusandrogynus L. Merr*), quails, vitamin A, vitamin E*

Introduction

The level of cholesterol intake higher than the level of need along with the lifestyle of the people who tend to consume lots of fatty foods. Food intake with high cholesterol continuously cause the increasing levels of cholesterol in the blood. Excess cholesterol (hypercholesterolemia) causes harmful health effects. Prevention

of high cholesterol in body such as by eating animal food products that low in fat and cholesterol. Katuk plants (*Sauropus androgynus L. Merr*) is an alternative plant that can decrease the cholesterol egg yolk and layer carcasses (Ibrahim, 2004). The purpose of extraction process is to take some or all substance in the plant. Subekti (2007) reported there were active compounds that contribute of decreasing cholesterol in egg yolks, liver and carcass treatment probably caused by phytosterol particularly stigmasterol high. Katuk leaves contain phytosterols 2.43 g/100 g and 466 mg/100 g dry fresh able to decrease serum of cholesterol, eggs, carcasses, and liver in quail (Subekti, 2007). Phytosterols which covers sterols and stanols of plants are found in plants as fats. Katuk leaves also contain vitamins A and E. The content of vitamin A which is quite high at 4337.34 µg/g can provide yolk color better. The function of vitamin E such as for avian reproduction, improve performance and strengthen the status immunoglobulin.

Materials and Methods

The experiment was conducted from June to September 2009. This research used quail (*Coturnix coturnix japonica*) 8-week-old female as many as 208 animals, were placed in battery cages and divided into 3 treatments with 4 replicates (13 quails in each replicate). The Treatment diets were control diet (R0); R0 + 0.15% KLE (R1); R0 + 0.30% KLE (R2). The first process of extraction was preparation of making Katuk Leaves Meal (KLM) showed in Figure 1 and Figure 2 presented the process of Katuk Leaves Extract (KLE). The preparation of KLE used 70% ethanol solvent. The analysis method for cholesterol content in meat, liver and eggs based on the Liebermann-Burchard (Kleiner and Dotti, 1962). The analysis method for fat content in meat, liver and eggs made by soxhlet method. Vitamin A and E content in meat, liver and quail eggs were analyzed by HPLC method (High Performance Liquid Chromatography). The experimental design used a completely randomized design.

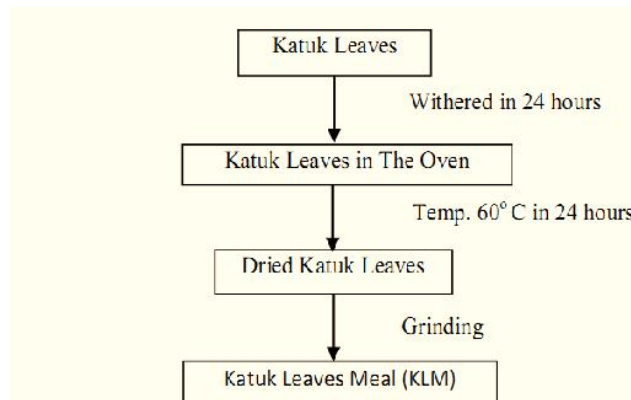


Figure 1. The scheme of Katuk Leaves Meal Process (KLM)

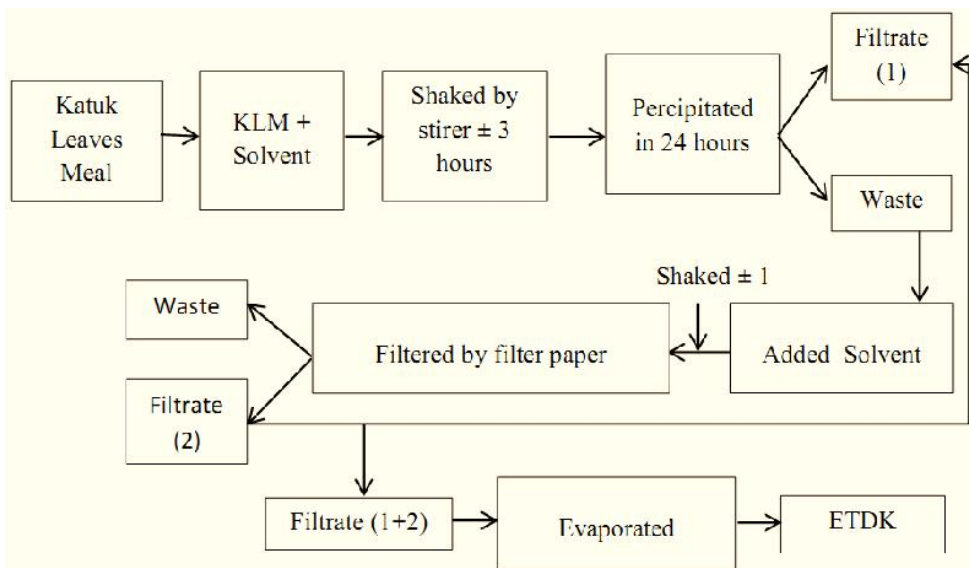


Figure 2. The scheme of Katuk Leaves Extract Proses (KLE)

The nutrient content of control diet and katuk leaves extract presented in Table 1, the nutrient content of treatment based on calculations presented in Table 2.

Table 1. The Nutrient Content of The Control Diet and Katuk Leaves Extract (As fed)

Nutrient (%)	Material	
	Control Diet*	KLE**
Dry Matter (%)	87.59	70.35
Ash (%)	10.45	5.65
CP (%)	18.21	19
Fiber (%)	9.58	0.21
Fat (%)	5.61	2.40
Beta-N (%)	43.74	43.21
Ca (%)	3.58	0.05
P (%)	1.25	0.03
Bruto Energy (Kal/g)	3980	3122

* Based on Analysis ITP Laboratory, IPB 2010

** Based on Analysis Fish Nutrition Laboratory, FPIK, IPB 2011

Table 2. The Nutrient Content of Treatment Based on Calculations

Nutrien	Diet		
	Control Diet	0.15% ETDK	0.30% ETDK
Dry Matter (%)	87.59	87.56	87.54
Ash (%)	10.45	10.44	10.44
CP (%)	18.21	18.21	18.21
Fiber (%)	9.58	9.57	9.55
Fat (%)	5.61	5.61	5.60
Beta-N (%)	43.74	43.74	43.74
Ca (%)	3.58	3.57	3.57
P (%)	1.25	1.25	1.25
Bruto Energy (Kal/g)	3980	3978	3977

Results and Discussion

Analysis of the cholesterol content (Figure 3) in meat, liver and eggs were conducted when the quails at 14 weeks old. The content of cholesterol in the liver and eggs decreased by increasing levels of KLE in feed. The giving of KLE 0.15% in feed could decrease the cholesterol 2.92% of the control, while increasing the level of 0.30% KLE could lower 22.81% of control. The decrease of cholesterol content in eggs by giving KLE 0.15% as many as 13.86% of control, by increasing the level 0.30% KLE cholesterol content decreased below R1 (0.15% KLE) of 19.86% of control.

The percentage decrease in the cholesterol content in meat, liver and eggs respectively 8.3%, 22.55%, 35.58% from the quail that gave feed control diet. The lowering in cholesterol content with giving KLE was influenced by the active compound (phytosterols) that contained in the katuk leaves. While the role of phytosterols, especially stigmasterol can lower cholesterol in egg yolks, liver, and quail carcass treatment (Subekti, 2007). The levels of cholesterol in liver appeared significantly higher than the meat and eggs, this is because the liver is where cholesterol synthesis in addition to the main gut, skin, testis, and aorta. In addition it is the highest organ role in cholesterol synthesis.

Figure 4 shows the fat content of meat, liver and eggs after 14-week-old quail. The same trend of decrease in cholesterol in the liver and eggs also occurs in fat. Fat content in the liver by giving 0.15% KLE could decrease 3.21% of control, and by giving 0.30% KLE 9.62% fat could be decreased. It also occurred in the egg, which fell 6.93% and 16.02% of control by giving KLE respectively 0.15% and 0.30% in the feed. The decrease of fat in liver content, meat and eggs due to lower

cholesterol, because cholesterol is a lipid that has a similar molecular shape fat, or cholesterol were included special types of lipids called steroids.

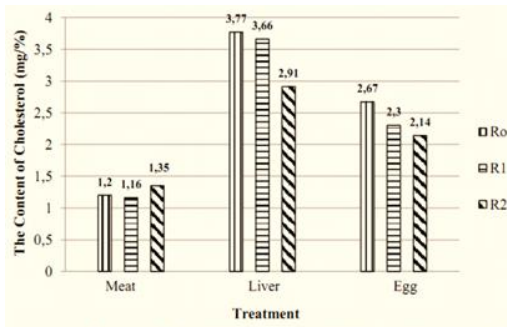


Figure 3. Cholesterol Content in Meat, Liver, and Egg Quail

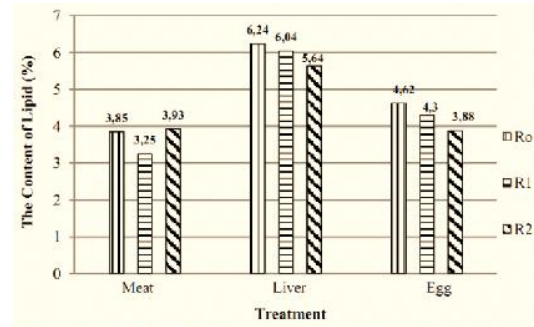


Figure 4. Lipid Content in Meat, Liver, and Egg Quail

The giving 0.15% and 0.30% KLE in the ration of the liver and eggs tend to be lower than the group without giving KLE (R0), it is presumably because the active compounds contained in extracts of katuk leaves is extracted perfectly. The increasing content of vitamin A on meat (Figure 5) with 0.15% and 0.30% KLE in feed as many as 2.44% and 16.81%. The increasing vitamin A of 0.30% KLE (R2) two times larger than the 0.15% KLE (R1) because the content of vitamin A is deposited large in meat. Figure 5 shows that the vitamin A content of the highest in the eggs deposited, it is possible because the animals that produce livestock products, if given the treatment it is shown the greatest influence on the resulting product. The same trend is shown in an increase in vitamin E (Figure 6). The content of vitamin E in the liver by giving 0.15% and 0.30% KLE tend to be lower than the quails didn't feed KLE (R0) occurred also in the study Subekti (2003).

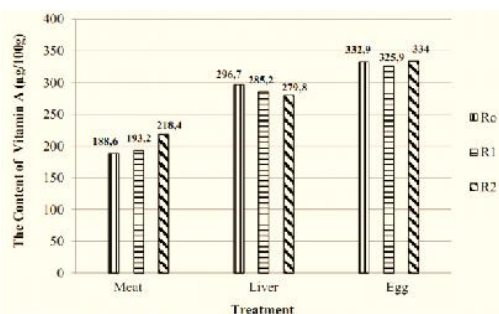


Figure 5. Vitamin A Content in Meat, Liver, and Egg Quail

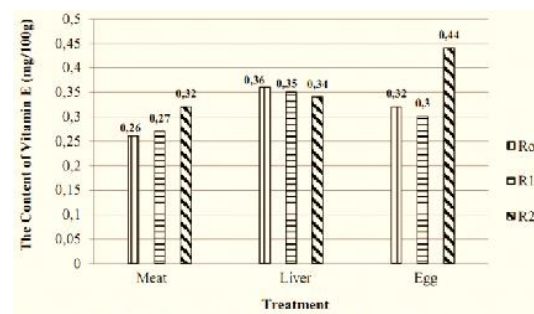


Figure 6. Vitamin E Content in Meat, Liver, and Egg Quail

Conclusions

The advantages of giving KLE in quails' diet were decreased the content of cholesterol, fat in the liver and eggs, and increased the vitamin A and E content in the meat and eggs.

References

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