Colacasia esculenta 2020

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The eggs cholesterol content and production that used *Colocasia esculenta Scho.* in local duck ration

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Abstract : *The use of plants or herbal feed ingredients has been shown to reduce the cholesterol content of livestock products, such as in ducks. One of the plants that has the potential as a feed ingredient is Colocasia esculenta, which is believed to reduce the cholesterol content of duck eggs and increase their production performance. As a treatment in this study is the level of use of Colocasia esculenta meal(CM), in 5 level treatments 0%, 5%, 10%, 15% and 20%, with 4 replications, which designed with a completely randomized design. As many as 80 ducks in the laying period were used, ranging in age from 19 weeks to 27 weeks. The data obtained showed that an increasing level of CM up to 10% resulted in increased egg production, egg weight and decreased feed convertion ratio. Conversely, the blood total cholesterol and triglyceride content actually decreased until the level CM was 20%, while the total cholesterol in egg yolk was decreased by using CM up to level 10%. The same tendency occurs in the blood triglyceride content and egg yolk. It was concluded that the use of TTDT up to a level of 10% could improve the performance of egg production, and the use of up to a level of 20% decreased the cholesterol and triglyceride content of blood and egg yolk. This is an important role about those subject for required healthy food for human nutrition.*

Keywords : *Colocasia esculenta, local duck, eggs production, cholesterol*

1. INTRODUCTION

In general, raising ducks on a commercial basis requires adequate dietary nutrition and supplementary feeding. The advantage of local ducks is the ability to survive in a poor environment and disease compared to chickens, also in utilizing low-quality feed, so that the cost of feed can be reduced. Local duck production also depends on its ability naturally or genetically.

The ration is the most important in the field of animal husbandry, because it covers 70% of the total production costs (1). Meanwhile, feed conversion ration is a measure of the coefficient of technical efficiency is often used, especially in the experimental development of poultry production.

One of the productions of poultry is an egg, which is an egg cell (ovum) that grows from a stem cell (oogonium) in the ovary (ovary) and is provided by poultry livestock as food material for embryo growth (2). Eggs are the center of concern by the community because they are rich in nutrients with relatively low prices. The egg productivity assessment of a group of ducks is to calculate daily production or PTH (Daily Egg Production). Egg productivity is good if the PTH value is more than 60%. Ducks have a high PTH value if they are maintained for no more than 18 months of age.

The biggest obstacle for people in consuming duck eggs is their concern about their high cholesterol content. Cholesterol is an amphipathic lipid that is important in regulating membrane permeability and fluidity, and also as an outer layer of plasma lipoproteins (3). Lipids consist of triglycerides (neutral fat), phospholipids (lecithin), and cholesterol (4). However, high levels of local duck cholesterol often become a limiting factor for consumers to be careful in consuming local duck products. Cholesterol in the body that is excessive will be buried in the walls of blood vessels and cause a condition called atherosclerosis where blood vessel constriction occurs. This condition is the forerunner to the occurrence of heart disease and stroke in consumers who consume chicken meat (5)

One solution to reduce the cholesterol content of duck products is the taro leaves and taro. The stems on the taro leaves contain a substance called saponin, which can eliminate cholesterol and can be used as an antiseptic. Taro leaves contain protein, carbohydrates, fats, calcium, phosphorus, iron. In taro leaves also contain vitamins A, B1, and C and taro leave also have polyphenols which function as antidotes to free radicals that damage cells in the body. Taro leaf is also a chronic medicine that contains flavonoids and saponins which function as anti-bacterial agents (6).

Taro leaf is a plant that contains many health benefits, namely as an antihypertensive, antidiabetic, antimicrobial and analgesic (7). Taro leaves contain various secondary metabolites. It is known that the taro leaf extract contains sugar, polyphenolic, terpenoid, saponin, alkaloid, glycoside, steroid or triterpenes, anthraquinone and coumarin components without cyanogenic. However, only tannins, glycosides and saponins without flavonoid can be obtained from the roots and stems of the Talas leaves. Besides, the phenolic compounds that have been identified in the Talas leaves are the flavonoid

group. Then that Taro leaves were shown to contain high antioxidants and various bioactive substances that would improve health (7).

Research using taro leaves in mice has been shown that it could reduce lipid content, cholesterol content, triglycerides, Choleterol-High Density Lipoprotein and Cholesterol-Low Dencity Lipoprotein (8). This shows that the *Colocasia esculenta Scho.* plant is thought to be able to reduce the cholesterol content of local duck products, thereby eliminating the limiting factor for people who want to consume local duck eggs.

This study aims to examine the use of *Colocasia esculenta Scho.* plant in local duck rations on egg production, and the content of cholesterol and triglycerides blood and local duck eggs.

2. Methods and Materials

This study used 80 local ducks, aged 19 weeks to 27 weeks, which were kept in a battery system enclosure. This research used of stems and leaves of *Colocasia esculenta Scho.* in the form of flour. *Colocasia esculenta Scho.* is already wide enough to be chopped 1 cm long, then dried in the sun to dry and easily destroyed, then milled until smooth and sifted with a 1 mm sieve mesh size, and than called *Colocasia esculenta Scho.* Meal (CM).

The ingredients of the ration used are listed in Table 1, with the composition of the research ration as listed in Table 2. The ration was given in the same amount of 150 g/e/d.

Table 1. The content of food substances ingredients ration

Food Substance	Conch Flour*	Fine Bran*	Ground Corn*	Concentrate 124	CM*
Dry matter (%)	87,37	90,70	91,29	89,63	73,00
Crude Protein(%)	41,06	12,04	8,60	34,00	4,10
Crude Fiber(%)	18,78	12,00	2,70	5,00	12,30
Crude Fiber(%)	1,30	1,70	4,20	3,00	2,10
ME(kcal/kg)	2600,00	1630,00	3420,00	2600,00	71,00
Calsium(%)	10,14	0,20	1,00	12,00	0,30
Phospor(%)	0,49	1,00	2,56	1,20	0,04

Note : CM (*Colocasia esculenta Scho.* Meal)
Source: *Poultry nutrition laboratory test (2014)

Table 2. Composition and content of food rations

Details	Treatment				
	P1	P2	P3	P4	P5
Ground corn(%)	56,50	56,50	57,50	57,00	58,00
Fine bran(%)	12,50	12,00	10,50	11,00	9,00
Soybean meal(%)	21,00	20,50	21,00	19,00	20,50
Fish flour (%)	10,00	10,50	10,00	11,50	10,00
CM (%)	0,00	5,00	10,00	15,00	20,00
E (kkal/kg)	2645,38	2683,66	2606,04	2604,73	2583,04
Crude protein(%)	17,03	17,06	16,90	17,13	17,53
Crude fat (%)	2,93	3,11	3,13	3,26	3,13
Crude fiber(%)	5,72	5,08	5,07	4,62	4,83
Ca (%)	3,45	3,82	3,94	4,35	4,28
P (%)	1,65	1,68	1,63	1,63	1,48

Calculate based on Table 1

The design used was Completely Randomized Design with 5 treatments using CM (0%; 5%; 10%; 15%; and 20%), each treatment repeated 4 times. Significant analysis results were carried out with the Duncan Multiple Range test.

Total cholesterol and triglycerides blood (TCB) and, obtained from duck blood serum taken through a vein in the pectoralis vein as much as 1 ml. Whereas Total Cholesterol yolk (TCY) was obtained from egg yolk extract using ethanol and technical acetone. Analysis, using the Microlab 300 Spectrophotometer.

The variables analyzed in this study were the performance of duck eggs production also TCB and TCY.

Results and Discussion

The results of studies on egg weight, egg production, and feed conversion ratio are as shown in Table 3.

Table 3. Average egg weight, egg production, and feed conversion

Treatment	Egg weight (g)	sdev	Egg production (%)	sdev	Feed conversion ratio	sdev
0% CM	60,425	3,45	69,65^{ab}	7,57	4,15^{b}	3,11
5% CM	60,075	4,79	73,81^{b}	8,21	4,25^{ab}	4,02
10% CM	64,12^{b}	3,91	75,92b	7,52	3,92^{b}	3,66
15% CM	60,76^{c}	6,71	67,45^{a}	8,40	4,66^{a}	4,83
20% CM	58,475	6,27	63,69a	7,84	4,73^{a}	5,10

Different superscripts in the same column show significantly different (P<0,05)

The average weight and egg production indicate that the increased use of TTDT in the ration to the level of 10% will increase production, but a decrease in the use of 15% and 20%. The use of Talas leaf flour has also been proven to significantly reduce the conversion of local duck rations to a level of 10%. This can be caused by the presence of anti-nutrient content such as Tannin, anthocyanin, and saponin in TTDT. It was reported that the ethanol extract of taro leaves have phenolic, anthocyanin, tannin, saponin, terpenoid, anthraquinone, alkaloid, flavonoid, sterol, carbohydrate, vitamin A and C (9).

Analysis Variance from egg weight, eggs production and feed conversion ratio obtained significantly different (P <0.05). This is because CM are known to contain bioactive substances and antioxidants (7), which can improve livestock health and increase production and are more efficient in utilizing feed, but at the 15% level, there is a decrease in egg weight and production, as well as an increase in feed conversion ratio.

Table 4 is the result of Total Cholesterol and Trigliceride content analysis on local duck blood and yolk based on the treatment.

The results of Table 4 illustrate that the increasing use of CM in the ration, it will reduce the average TC and Tgs (P <0.01), although it increased again at the level of 15% but not significantly different (P> 0.05) between the level of 10% up to 20%. Likewise, the content of egg cholesterol was also very significantly decreased (P <0.01), along with with an increase in the use of taro leaf flour, but the results of the DMRT showed no significant difference (P> 0.05) between the use of CM 5% to 20%

Table 4. Total cholesterol (TC) and Triglycerides (Tgs) content

Treatment	Blood Total Cholesterol	sdev	Yolk Total Cholesterol	sdev	Blood Trigliceride	sdev	Yolk Trigliceride	sdev
0% CLM	165,60^{a}	6,11	204,63^{a}	3,27	191,75^{a}	8,14	200,70^{a}	28,89
5% CLM	163,10^{a}	1,31	156,55^{c}	9,12	162,8875^{b}	3,56	187,43^{b}	23,26
10% CLM	135,23^{c}	3,58	148,88^{c}	2,69	135,4^{c}	4,05	173,00^{c}	28,12
15% CLM	139,2^{b}	5,39	172,13^{b}	3,99	142,575^{c}	2,39	177,65^{c}	11,16
20% CLM	138,30b^{c}	7,43	172,43^{b}	8,70	142,3325^{c}	2,36	180,35^{b}	17,54

Different superscripts in the same column show significantly different (P<0,05)

This shows that the use of Talas leaf flour has the opportunity to produce low cholesterol duck products due to the presence of saponin substances that function to reduce cholesterol. Stalks on taro leaves contain a substance called saponin, which can eliminate cholesterol and as an antiseptic (6). Taro leaves contain various secondary metabolites. It is known that the taro leaf extract contains components of sugar, polyphenolic, terpenoids, saponins, alkaloids, glycosides, steroids (10).

3. Conclusion

The use of flour from Talas leaf stalks in local duck rations, can increase egg production and reduce feed conversion to a level of 10%, as well as reduce the total cholesterol content of blood and eggs.

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