

THE USE OF *CURCUMA ZEDOARIA*, ROSC MEAL TO REDUCE ABDOMINAL FAT AND MEAT CHOLESTEROL IN BROILER

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Abstract

This research was held to find out the effects of *Curcuma zedoaria*, Rosc meal in the ration on abdominal fat and meat cholesterol on broiler. The experiment used 100 broiler day old chicken with a Completely Randomized Design (CRD). The ration treatments were R_0 : Based ration, R_1 : Based ration + 3.5% of *Curcuma zedoaria*, Rosc meal, R_2 : Based ration + 4.5% of *Curcuma zedoaria*, Rosc meal, and R_3 : Based ration + 5.5% of *Curcuma zedoaria*, Rosc meal, where each treatment was repeated five times and each repeated consist of five broiler chicks. Variable analyses were percentage of abdominal fat and the cholesterol of broiler meat. Statistical analysis indicated that addition of *Curcuma zedoaria*, Rosc meal in the broiler ration did not affect ($P>0.05$) the percentage of abdominal fat, however it significantly ($P<0.05$) affected the cholesterol of broiler meat. The conclusion even though the addition of *Curcuma zedoaria*, Rosc meal in the broiler ration did not significant affected to percentage of abdominal fat but the additional *Curcuma zedoaria*, Rosc meal until 4.5% in the ration it is significantly reduced the level of cholesterol broiler meat.

Key words: *Curcuma zedoaria*, Rosc, Abdominal Fat, Meat Cholesterol, Broiler

INTRODUCTION

Broiler has sufficient potential to supply community needs for animal protein. Broiler growing tend to be followed by body fat and abdominal fat increased. Abdominal fat accumulation in the carcass unfortunately is a problem during processing so that the carcass disposed by products and during frying, fat will increased the cooking loss [6]. In addition high levels of fats in broiler often lead high false perception among the public that broiler meat was cholesterol source.

To anticipated it, producing lower meat products by manipulating the nutritional content of rations. Several studies have been done using natural ingredients in rations e.g curcuminoid which minimized cholesterol, such as *Curcuma xanthorrhiza*, Roxb, garlic or *Curcuma zedoaria*, Rosc meal that frequently used as ingredients of traditional medicine or herbs [7]. Using *Curcuma xanthorrhiza*, Roxb in the ration can reduced cholesterol levels and indicated can raised lipoproteins levels [1]. This is related with the active substances, in *Curcuma xanthorrhiza*, Roxb e.g colagoga could stimulated gall juice secretion, so could

suppressed the abdominal fat accumulation [8].

Curcuma zedoaria, Rosc is one of medicinal plants used as herbal medicine component production. Rhizome are very nutritious as stomachic, strengthen digestion and appetite, stimulating intestine movements and eliminate indigestion [9;10], containing atsiri oil (volatile oil) and curcuminoid [5] and FMIPA, UNPAD, 2001 showed that curcumin not detected in *Curcuma zedoaria*, Rosc meal. Astiri oil can help digestion by stimulating the nervous system secretion, produced digestive enzymes that contain pepsin, trypsin, lipase, amylase and secreted into stomach and intestines that increased nutrients metabolism [4]. Using atsiri oils of *Curcuma zedoaria*, Rosc dose of 450 mg, 600 mg, and 800 mg / kg of body weight in mice two of five mice treated with 800 mg/kg of body weight was dead, determined the levels of *Curcuma zedoaria* Rosc meal. There is an effects of atsiri oil on function of digestive tract, especially in small intestine and become toxic in high doses, so the right use of

Curcuma zedoaria, Rosc meal can reduce abdominal fat and meat cholesterol. Therefore, this study conducted to find out the effect of adding *Curcuma zedoaria*, Rosc meal in the ration of abdominal fat and meat cholesterol.

MATERIALS AND METHODS

The study was conducted over 6 weeks, used 100 day old chick broiler which placed randomly on 20 plot experiment cage 60 x 80 x 40 cm size for 5 chicks, equipped with feeder, drinker and 40-watt of bulb lamps, as a heater.

Curcuma zedoaria, Rosc meal is one medicinal plants used as herbal medicine

component production, containing curcuminoid and atsiri oil (volatile oil) [5].

The rations formula were :

R₀ = Based ration without *Curcuma zedoaria*, Rosc meal

R₁ = Based ration + 3.5% *Curcuma zedoaria*, Rosc meal

R₂ = Based ration + 4.5% *Curcuma zedoaria*, Rosc meal

R₃ = Based ration + 5.5% *Curcuma zedoaria*, Rosc meal

The composition of based ration are in the Table 1. The nutrient and metabolism energy content of four treatments are in Table 2.

Table 1. Composition of Based Rations

Ingredients	Treatment			
	R0	R1	R2	R3
Concentrated (%)	38	38	38	38
Yellow corn (%)	54	54	54	54
Rice bran (%)	8	8	8	8
<i>Curcuma zedoaria</i> , Rosc meal (%)	0	3,5	4,5	5,5

Table 2. The Nutrient and Metabolism Energy Content in Rations

Nutrition component	Treatment			
	R0	R1	R2	R3
Crude protein (%)	22.34	22.47	22.79	22.98
Crude fat (%)	4.22	4.70	4.98	5.8
Crude fiber (%)	5.06	5.16	5.36	5.67
Ca (%)	1.51	1.53	1.54	1.56
P (%)	0.78	0.79	0.79	0.79
Energy metabolism (kcal/kg)	3018.44	3024.56	3028.59	3029.43

UNPAD, 2009.

The experiment used Completely Randomized Design (CRD), with four treatments and each treatment was five times repeated. The data was analyzed with random simple test, and with Duncan's Multiple Range Test among the treatment. Percentage of abdominal fat and meat cholesterol are the variables. During the research, chickens were given only water without antibiotics and vitamins. ND vaccinations given at 3 days of age by eye drops and IBD vaccinations done

at 14 days of age and lasota ND vaccinations given at 21 days of age by injection.

RESULTS AND DISCUSSION

The Effect of Treatment on Abdominal Fat in Broiler

The Average levels of Abdominal Fat percentage of the treatments is showed in Table 3.

Table 3. Average levels of Abdominal Fat on Each Treatment

Replication	Treatment			
	R0	R1	R2	R3
	%.....			
1	2.38	2.56	2.14	2.34
2	2.23	2.21	2.08	2.46
3	2.56	2.13	2.18	2.19
4	2.33	2.22	2.08	2.21
5	2.35	2.28	2.32	2.30
Total	11.75	11.40	10.80	11.50
Average	2.35 ^a	2.28 ^a	2.16 ^a	2.30 ^a

The average abdominal fat percentage showed at Table 3. The abdominal fat percentage levels were variation, where R₃ giving 4.5 percent *Curcuma zedoaria*, Rocs meal in the ration is the lowest (2.16%) and those in R₀ without *Curcuma zedoaria*, Rosc was highest (2.35%). The data were followed with statistic analysis. The results indicated that all treatments have no significantcy on the abdominal fat. Using *Curcuma zedoaria* Rosc meal 3.5 -

5.5 percent in ration has no effect (P> 0.05) on the abdominal fat percentage. Adding until 5.5% *Curcuma zedoaria* Rosc in the ration broiler has advantages, because the bioactive substances as curcumin and atsiri oil would improved the metabolism of carbohydrates and fat in the body.

The Effect of Treatment on Meat Cholesterol

Table 3. Average Levels of Broiler Meat Cholesterol

Replication	Treatment			
	R0	R1	R2	R3
	mg/100ml.....			
1	80.50	70.05	68.99	78.53
2	78.06	72.16	69.70	74.25
3	80.37	69.52	67.86	75.28
4	73.06	68.53	68.67	75.42
5	78.72	70.20	68.63	75.95
Total	390.71	350.46	343.85	379.43
Average	78.142 ^a	70.092 ^b	68.770 ^b	75.886 ^a

The average meat cholesterol levels were showed at Table 3. The meat cholesterol levels were variation, where R₂ treatment is the lowest (68.77 mg/100 ml) and R₀ the highest (78.14 mg/100 ml). The data were followed with statistic analysis. Results indicated that by treatment adding 3.5 - 4.5 percent *Curcuma zeedoaria*, Rosc meal in the ration gave the best results of meat cholesterol, and significant (P < 0.05) among others treatment (R₀ and R₂). By giving 5.5 percent *Curcuma zedoaria* Rosc in the ration, can increased meat cholesterol. In R₃ (5.5%) has atsiri oils lack of function so it increased the abdominal fat and meat cholesterol levels even in normal limits. [8]

CONCLUSIONS

- By adding *Curcuma zedoaria* Rosc until 5.5 percent in the ration gave no significant effects on abdominal fat percentage
- By adding *Curcuma zedoaria*, Rosc until 4.5 percent in ration can suppressed result on meat cholesterol than R₃ (adding 5.5% *Curcuma zedoaria*) and R₀ (without *Curcuma zedoaria*)

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