

The Effect of Candlenut (*Aleurites mollucana* (L.) Willd.) Usage as Feed Additive on Broiler Performance

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Abstract: The purpose of this research was to investigate the use of candlenut powder (*Aleurites mollucana* (L.) Willd.) as feed additive on broiler performance. Materials used in this research were 200 day-old broiler chicks. Research method were in vivo in Completely Randomized Design with 5 treatments (P0 = basal diets, P1 = basal diets + 0.25 % candlenut powder, P2 = basal diets + 0.50 % candlenut powder, P3 = basal diets + 0.75 % candlenut powder, P4 = basal diets + 1 % candlenut powder), each treatment replicated 5 times. Variable measures were live performance (feed intake, FCR, BWG, and IOFC), tabulated data were analyzed using Analyze of Variance (ANOVA), significant differences continued with Duncan's Multiple Range Test. The result showed that candlenut powder usage as feed additive gave significantly influenced ($P < 0.01$) on feed consumption, feed conversion ratio. The treatment did not give significant influenced ($P > 0.05$) on average daily gain and income over feed cost. It can be concluded that candlenut powder usage in feed as feed additive the optimum level of 1 %.

Keywords: broiler, candlenut powder, broiler performance.

INTRODUCTION

The increasing of population and improvement nutritious food cause need increasing of food from animal origin (meat, egg or milk). Broiler meat was the most popular for public due to cheaper and short cycles rearing period. Important to improve Indonesian public protein consumption through improving broiler production.

Almost 60 – 70 % of total cost cashed in feed. Feed efficiency might be improve by feed additive usage as vitamins source, minerals and antibiotics. Antibiotic usage might be affected residual on poultry products and potentially to give bacteria resistance to consumer that consume poultry product. Need more innovation using herbal feed additive using candlenut.

Candlenut contain essential fatty acid. Rohaida *et al.*, [1] reported that in candlenut contain essential fatty acid such as lenoleic acid 29,5 %, linoleic acid 41,6 %, oleic acid 21,6 %, palmitic acid 4,9 %, and steric acid 2,4 %. Rashid *et al.*, [2] reported that control candlenut supplementation 2 % in feed might improve broilers performance. Candlenut also contain bioactive substance such as polyphenol and saponine, candlenut polyphenol can be subjected as antioksidant that can stabilize free radical. Then saponine can be functioned as antibacterial agent, if total saponine in a few amount.

Andri *et al.*, [3] stated that lenolenic fatty acid can be decrease total of VLDL-cholesterol and plasmic triglyceride in mojosari duck egg.

MATERIALS AND METHODS

200 Day old broiler chick with average body weight $34,7 \pm 7,9$ g/chick and reared 35 days. Candlenut powder used as feed additive. Feed and drink add libitum. Diets nutritional content presented in Table 1. Research methods used were in vivo. There are 5 treatments and 5 replication each.

The treatments were:

- P0 : basal diets without candlenut
- P1 : basal diets + 0,25 % candlenut powder
- P2 : basal diets + 0,50 % candlenut powder
- P3 : basal diets + 0,75 % candlenut powder
- P4 : basal diets + 1 % candlenut powder

Table-1: Nutritional content of candlenut powder and diets

Nutritional Content	CP ¹	P0	P1	P2	P3	P4
Dry Matter (%)	96,59	88,67	88,69	88,71	88,73	88,75
Crude Protein (%)	19,31	20,68	20,67	20,67	20,67	20,66
Crude Fat (%)	2,23	3,32	3,32	3,32	3,32	3,31
Crude Fiber (%)	65,29	6,22	6,37	6,52	6,66	6,81
Ash (%)	2,83	4,72	4,71	4,71	4,70	4,70
Gross energy (Kcal/kg)	7559	2374	2381	2388	2396	2403

Note: proximate analysis in feed and animal nutrition laboratory, Faculty of Animal Science, Brawijaya University, Malang.

1.CP: Candlenut Powder

Variable measure were 1) feed intake, 2) body weight gain, 3) feed conversion ratio, and 4) income over feed cost, The data were analyzed using Analysis of Variance (ANOVA) on Completely Randomized Design (CRD). If there are significant differences would be continued with Duncan's Multiple Range Test [4].

RESULTS AND DISCUSSION

The effect of candlenut powder as feed additive on broiler performances

The effect of candlenut powder as feed additive on broiler performances (feed intake, body weight gain, feed conversion ratio, and income over feed cost) has been shown in Table-2.

Table-2: The effect of candlenut powder as feed additive on broiler performances

Treatments	Feed Intake (g/chick)	BWG ¹ (g/chick)	FCR ²	IOFC ³ (IDR/chick)
P0	4304 ± 90 ^b	2465 ± 83	1,75 ± 0,08 ^b	9626 ± 2454,8
P1	4293 ± 58 ^b	2390 ± 144	1,80 ± 0,13 ^b	8546 ± 2099,7
P2	4261 ± 55 ^b	2425 ± 168	1,76 ± 0,11 ^b	8075 ± 2668,2
P3	4183 ± 67 ^b	2502 ± 137	1,68 ± 0,11 ^{ab}	12212 ± 3678,1
P4	3989 ± 50 ^a	2585 ± 67	1,54 ± 0,03 ^a	8965 ± 1287,1

Note: different superskrip (a-b) in same column showed significantly differences (P<0,01).

¹) BWG: Body Weight Gain

²) FCR: Feed Conversion Ratio

³) IOFC: Income Over Feed Cost

Analysis of variance showed that the treatment give significantly differences (P<0,01) on feed intake and feed conversion ratio, while body weight gain and income over feed cost did not give significant differences (P>0,05), Tabel-2 showed that the higher feed intake showed on without candlenut powder addition until 4304 g/chick, and the lower showed on 1 % candlenut powder addition until 3989 g/chick, this could be indicated that candlenut powder addition in broiler diets capable to improve nutrient digestability on broiler diets. Candlenut powder contain essential fatty acid such as linoleic acid 42,08 % and lenolenic acid 27,30 %, Zhang *et al.*, [5] reported that acidifier and essential oil mixture addition in feed did not give significant differences on feed intake, but give significantly differences to (P<0,01) reduce feed conversion ratio.

The higher average broiler body weight gain showed on 1 % candlenut powder addition until 2585 g/chick, and then followed by 0.75 % candlenut powder addition until 2502 g/chick, 0.50 % candlenut powder addition until 2425 g/chick, 0.25 % candlenut powder addition until 2390 g/chick and without candlenut powder addition until 2465 g/chick. Those results

showed that candlenut addition with different level in broiler diets give same body weight gain, but higher candlenut powder addition up to 1 % in broiler diets showed disposed can be increase body weight gain. Candlenut powder contain linoleic fatty acid up to 42.08 % as omega-6 that might bond free radical to improve nutrient digestability by reducing free radical on broiler.

The higher average broiler feed conversion ratio showed in without candlenut powder addition until 1.75 and then followed by 0.25 % candlenut powder addition until 1.80, then 0.50 % candlenut powder addition until 1.76, then 0.75 % candlenut powder addition until 1.68 and 1 % candlenut powder addition until 1.54. The lowest FCR in 1 % candlenut powder addition followed by lowest feed intake but produce same body weight, 0.50 % candlenut powder addition did not reduce FCR yet, while 1 % candlenut powder addition can be reduce FCR of broilers.

The lower IOFC has shown on 0.50 % candlenut powder addition until 8075 IDR/chick, and then followed by 0.25 % candlenut powder addition until 8546 IDR/chick, 1 % candlenut powder addition

until 8965 IDR/chick, 0.50 % candlenut powder addition until 9626 IDR/chick and the higher IOFC has shown on 0.75 % candlenut powder addition until 12212 IDR/chick. Table 2 showed that candlenut powder addition give significantly differences on IOFC of broiler. Candlenut powder addition in broiler diets more than 1 % might reduce IOFC, but also reduce feed intake and FCR. There are many factor can influence IOFC value such as feed intake, final broiler body weight, price of broilers feed, and price of broilers [6].

CONCLUSION

Candlenut powder addition until 1 % in broiler diets can increase body weight gain, and *Income Over Feed Cost* (IOFC), and also can reduce feed intake, and feed conversion ratio of broilers.

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