

Effect of *Sauropus androgynus* Leaf Extract plus Turmeric Powder Supplementation on Broiler Performance

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ABSTRACT

A factorial design was used to evaluate the effect of *Sauropus androgynus* leaf extract (SALE) and turmeric powder (TP) on performance of broilers fed high-fat diet. Two dietary fat sources (6% beef tallow or 6% palm oil), and five mixtures of SALE plus TP (0 g SALE plus 0 g TP, 9 g SALE plus 0.5 g TP, 18 g SALE plus 0.5 g TP, 9 g SALE plus 1 g TP, 18 g SALE plus 1 g TP) were studied. Experimental results showed that dietary fat sources, and SALE plus TP mixture had no effect on body weight gain, feed intake and feed conversion ratio ($P>0.05$). No interaction was found between two factors ($P>0.05$). In conclusion, the addition of SALE plus TP to high-fat diet did not improve broiler performance.

Key words: *Sauropus androgynus*, turmeric, performance

INTRODUCTION

Fats have an important role in the diet of broiler chickens. They functions as a source of energy and essential fatty acids, and these fats also increased diet palatability and fat-soluble vitamins absorption. Thus, feeding a high-fat diet may be useful in meeting the energy requirements of broiler chickens. In addition, feeding a high-fat diet improves growth efficiency because of enhanced feed efficiency (Breslin *et al.*, 2010; Jeffri *et al.*, 2010), and causes longer feed retention in the gastrointestinal tract; and improves nutritional digestion and absorption (Fouad and El-Senousey, 2014).

Sauropus androgynus leaf extract (Santoso, 2001; Santoso *et al.*, 2002) and turmeric (Durrani *et al.*, 2006) also improved growth performance in broiler. Therefore, the present study was conducted to evaluate effect of fat sources and *Sauropus androgynus* leaf extract plus turmeric powder on broiler performances.

MATERIALS AND METHODS

***Sauropus androgynus* leaf extraction:**
Sauropus androgynus leaf was extracted

according to the method of Santoso *et al.* (2005), whereas turmeric powder was obtained from the traditional drug market. Basal diet contained 19% crude protein and 3,200 kcal ME/kg diet.

Animals and diets: Two hundred broilers were purchased (Arbor Acres) from commercial hatcheries. The broilers used in this study were maintained according to Santoso *et al.* (2015^a). On arrival, the broilers were placed in a single pen surrounded with a bamboo ring and kept on rice husks at a depth of approximately 5 cm. They were fed commercial starter diet for 20 days. At 21 days of age, the broilers were weighed and selected on the basis of body weight. One hundred and fifty broiler chickens aged 21 days were then distributed to ten treatment groups of 3 pens as replicates. Each pen contained 5 broiler chickens. The present experiment was arranged as completely randomized factorial design (2 x 5) in which two dietary fat sources (6% beef tallow or 6% palm oil), and five mixtures of SALE plus TP (0 g SALE plus 0 g TP, 9 g SALE plus 0.5 g TP, 18 g SALE plus 0.5 g TP, 9 g SALE plus 1 g TP, 18 g SALE plus 1 g TP) were evaluated. Broilers were weighed weekly and feed intakes were recorded daily.

Broilers were fed commercial starter diet for one day to 20 days of age. Thereafter, they were fed experimental diets (Table 1). Drinking water and diets were given *ad libitum*.

Data analysis: All data were subjected to analysis of variance as a 2 × 5 factorial arrangement of dietary treatments with dietary fat sources and SALE-TP mixture as main effects. Duncan’s Multiple Range Test was used to determine which treatments were significantly different.

RESULTS AND DISCUSSION

Experimental results showed that dietary fat sources had no effect on body weight gain, feed intake and feed conversion ratio (P>0.05) (Table 1), whereas supplementation of SALE plus TP mixture did not affect those variables (Table 2). No interaction (P>0.05) between two factors was found (Table 3).

The present study showed that the supplementation of SALE plus TP mixture did not improve growth performance of broiler chickens fed a high-fat diet. These results were different from Santoso (2001) and Santoso et al. (2002) who found that supplementation of SALE enhanced growth performance of those

fed a normal-fat diet. Durrani et al. (2006) found that supplementation of 0.5% turmeric powder enhanced growth performance of broiler chickens. Lower supplementation of turmeric powder did not increase growth performance of broiler chickens (Mehala and Moorthy, 2008; Sinurat et al. 2009). Therefore, the level of turmeric powder applied in the present study should be increased to improve growth performance. Santoso et al. (2015^b) also reported that supplementation of SALE plus TP to a low-protein diet did not improve broiler performance.

Feeding a beef-tallow diet resulted in similar performance quality to feeding a palm-oil diet in the present study. This result was in contrary with Alao and Balnave (1985) who reported that unsaturated vegetable-oil diet produced lower faecal energy losses than animal-fat diet, and therefore, it improved growth performance. It has been established that beef-tallow and palm-oil had a relatively similar amount of unsaturated fatty acid (Chowdhury et al., 2007; Rezaei et al., 2013), and therefore, they caused similar quality of performance.

Table 1. Effect of dietary fat sources on performance of broiler chickens fed a high-fat diet

Variables	6% BT	6% PO	SD	P
Body weight gain (g/bird)	1,062.8	1,029	52.0	ns
Feed intake (g/bird)	2,367	2,399	55.5	ns
Feed conversion	2.21	2.33	0.13	ns

BT= beef tallow, PO= palm oil, ns= non significant.

Table 2. Effect of *Sauropus androgynus* leaf extract plus turmeric powder supplementation to a high fat diet on performance of broiler chickens

Variables	P1	P2	P3	P4	P5	SD	P
Body weight gain (g/bird)	1,047.5	1,072.8	1,097.3	964.7	1,047.2	57.2	Ns
Feed intake (g/bird)	2,335	2,350.3	3,665.7	2,322.3	2,451.3	79.8	Ns
Feed conversion	2.26	2.20	2.16	2.44	2.37	0.17	Ns

P1= 0 g *Sauropus androgynus* leaf extract (SALE) + 0 g turmeric powder (TP); P2=9 g SALE + 0.5 g TP; P3=18 g SALE + 0.5 g TP; P4=9 g SALE + 1 g TP; P5=18 g SALE + 1 g TP. Ns= non significant.

Table 3. Interaction effect of *Sauropus androgynus* leaf extract plus turmeric powder supplementation, and dietary fat sources on performance of broiler chickens

Variables	Beef Tallow (BT)					Palm Oil (PO)					SD	FSxFT
	P1	P2	P3	P4	P5	P1	P2	P3	P4	P5		
Body weight gain (g/bird)	1,048	1,079	1,123	1,029	1,068	1,047	1,067	1,105	900	1,026	129.6	ns
Feed intake (g/bird)	2,422	2,275	2,385	2,291	2,427	2,248	2,426	2,437	2,353	2,476	176.9	ns
Feed conversion	2.31	2.11	2.13	2.23	2.27	2.15	2.27	2.20	2.62	2.41	0.27	ns

P1= 0 g *Sauropus androgynus* leaf extract (SALE) + 0 g turmeric powder (TP); P2=9 g SALE + 0.5 g TP; P3=18 g SALE + 0.5 g TP; P4=9 g SALE + 1 g TP; P5=18 g SALE + 1 g TP. Feed supplement (FS) contained SALE and TP mixture. FT= dietary fat sources. ns= non significant.

CONCLUSION

In conclusion, the addtion of SALE plus TP to high-fat diet did not improve broiler performance.

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