
GROWTH PERFORMANCE OF BROILER CHICKS ON ORAL ADMINISTRATION OF ALLIGATOR PEPPER SEED EXTRACT

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ABSTRACT

The impact of giving different dosage of Alligator pepper seed extract (EAPS) orally to broiler starter chicks in order to assess their growth performance was studied. The powdered dried alligator pepper seeds were soaked in ethanol at a weight-to-volume ratio of 1:2. The mixture was filtered, 20% of the filtrate was made and put to use in this study. In a completely randomized design (CRD), 120 1-day-old broiler chicks were divided into 4 (four) treatments, each consisting of three replicates, with ten chicks per replicate. The birds were examined on a 28-day feeding period. Treatment 1, the control group, was given 0.25 mL/litre of a conventional antibiotic (Enrovet) in their drinking water. Treatments 2, 3, and 4 were given thus; 10, 15, and 20 mL/litre of water (EAPS) in their drinking water, respectively. One way analysis of variance was used to analyzed the feed intake, weight gain, and feed conversion ratio data. The findings revealed that there were no significant ($p>0.05$) differences in any of the growth parameters measured; however, there was a progressive numerical increase in the chicks' final body weight and a corresponding decrease in their FCR as the dosage of the test herb was increased. T4 had the highest final weight, daily weight gain and least FCR value of 977.30 g, 40.82 g and 1.62 respectively. It was concluded that administration of EAPS had growth enhancing properties and can be used in starter broiler production.

Keywords: alligator pepper, antibiotics, broiler chick, growth promoter

INTRODUCTION

There have been reports of complications in livestock and consumers of animal products, including prolonged illness and death, as well as the development of resistance to antibiotics and other drugs by pathogens (Afolabi and Eko, 2016). This sparked researchers' interest in studying and researching the use of spices, herbs, plant extracts, and their products as organic supplements in animal feed (Owen, 2011; Ndelekwute *et al.*, 2015; Afolabi *et al.*, 2016).

Biogenic additives (herbs, spices, plant extract, and essential oils) have been reported to have appetizing benefits (Nte, *et al.*, 2017) and antibacterial properties (Alcicek *et al.*, 2003). Herbs have the potential to improve the performance of broilers without side effects. Among the useful herbs indigenous to Africa is Alligator pepper (*Aframomum melegueta*). It belongs to the plant family *Zingiberaceae* (Edeoga *et al.*, 2005). Important phytochemicals, including alkaloids, triterpenes, tannins, glycosides, flavonoids, oils, and sterols have been found to be present in alligator pepper seeds, according to different studies (Edeoga *et al.*, 2005; Doherty *et al.*, 2010).

Research on aqueous extract of herbs has brought concerns because of the polarity of some of phytochemical compound which cannot be extracted using water. This research therefore focuses on the ethanol in extracting components of the herbal plants.

MATERIALS AND METHODS

Experimental site

The study was carried out at the Teaching and Research Farm, Agricultural Technology Department, Federal Polytechnic, Ilaro. It is situated in the Yewa South Local Government (Weather Spark, 2017).

Preparation of Experimental herbs

Alligator pepper was gotten from the Ilaro local markets. After being taken out of the epicarp, the seeds were allowed to air dry for a day before being ground into powder in a blender (a "Pyramid® PM-B999").

Preparation of Ethanol Extract

Five hundred grams (500 g) of Alligator pepper seed powder was soaked in 1000 mL of ethanol (99.9% purity) for 24 hrs. The mixture was filtered using muslin cloth (Hassan and Jaffer, 2019) after which twenty percent (20%) of the filtrate was prepared (Enye *et al.*, 2022).

Experimental animal and management.

A reputable commercial hatchery provided the one hundred and twenty day-old broiler chicks that were used for the study. The birds were allowed to acclimate in the brooding pen. Standard routine and vaccinations management practices for broiler chickens was strictly adhered to. Commercial broiler starter and finisher diets and water were given *ad libitum* to the birds for four weeks, the period of the experiment.

Experimental design

The birds were divided into four groups (treatments) of thirty each at random. Each treatment was replicate thrice with 10 birds per replicate. Extract of alligator pepper seed (EAPS) was administered to each treatment at dosage 0, 10, 15 and 20 mL per liter of water respectively.

Treatment 1: Control 0 ml of EAPS (but synthetic antibiotics (enrofloxacin) was administered to the birds).

Treatment 2: 10 ml EAPS per litre of water.

Treatment 3: 15 ml EAPS per litre of water.

Treatment 4: 20 ml EAPS per litre of water.

Data Collection**Feed intake**

On a daily basis, the amount of leftover feed was deducted from the amount given in order to record the amount of feed consumed. Feed intake (g) = Feed given (g) – feed leftover (g)

Weight gain

Body weight was measured once the study began (initial weight) and then once a week after that (final weight).

Weight gained (g) = Final weight (g) – Initial weight (g)

Feed Conversion ratio

Feed conversion was calculated by dividing the total feed consumed by total weight gained.

$$FCR = \frac{\text{Total feed consumed (g)}}{\text{total weight gained (g)}}$$

Statistical Analysis.

The collected data were analyzed using ANOVA, and the Turkey test, a feature of IBM SPSS 26, was used to separate the treatment means. Statistical significance was considered to be at $P < 0.05$ (SPSS 2022).

RESULT AND DISCUSSION

Table 1 demonstrated that the growth parameters measured were not significantly ($p < 0.05$) affected by the oral administration of Alligator Pepper seed extracts. As the test herb dosage was increased, there was a progressive numerical increase in the chicks' final body weight and a corresponding decrease in their FCR. T4 had the lowest FCR value of 1.62, the highest final weight (FW) of 977.30 g, and the highest daily weight gain (DWG) of 40.82 g.

Table 1. Effects of oral administration of Alligator Pepper seed extracts on growth performance of broiler chicks

Treatments	I W (g/b)	F W (g/b)	D W G (g/b/d)	F I (g/b/d)	FCR
T1	118.69	962.10	40.16	70.24	1.76
T2	118.69	920.50	38.18	66.66	1.74
T3	119.95	942.40	39.17	67.02	1.71
T4	119.95	977.30	40.82	66.39	1.62
P-Value	0.98	0.62	0.65	0.11	0.35
SEM	1.43	14.94	0.72	0.86	0.02

^{a,b,c} Means in the same column by factor with different superscripts are significantly ($P < 0.05$) different, SEM: Standard error of means.

DISCUSSION

The result of this study showed similarities in the FW, DWG, FI and FCR of the chicks between the control treatment and others who received extracts of alligator pepper. This implies that extract of alligator pepper seed can successfully be used as a growth enhancer in starter broiler production. As the test herb dosage was increased, there was a progressive numerical increase in the chicks' final body weight and a corresponding decrease in their FCR. This suggests that extract of alligator pepper seed has good growth-promoting abilities. The results from this study corroborates that of Chomini *et al.* (2020) also reported that ethanolic seed extracts of *Aframomum melegueta* had the presence of important phytochemical compounds. Anugom and Ofongo (2019) also reported higher numerical values in final weight, weight gain and FCR of broiler chicks administered *Occimum gratissimum* leaf extract compared to the birds in the control group, he attributed improved growth performance to the positive effects of phytobiotics ethanol extracts. This result agrees with that of Afolabi and Eko (2016) who reported that addition of alligator pepper seed gave optimum performance of pullet at starter phase and confirms the report from Chakraborty (2018) who reported an improved growth performance of chicken fed alligator pepper meal.

CONCLUSION

It was concluded that administration of extract of alligator pepper seed enhanced the growth of broiler chicks and can therefore be used as growth promoter in starter broiler chicks production.

RECOMMENDATION

To stimulate feeding and achieve optimal weight gain with excellent feed conversion ratio, administration of EALPS can be adopted.

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