

## The Effect of Dietary Clove Oil on Broiler Performance

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**Abstract:** This study was carried out to determine the effect of addition different levels of clove oil, as a natural growth promoter, on broiler the performance .105 unsexed, 7day-old commercial broiler chicks (Ross 308) were divided randomly into five groups, each group was subdivided into three replicates with seven chicks per each. The control diet was formulated to meet the nutrient requirements of broiler chicks (A),diet B was supplement with antibiotic(0.01),diets C,D and E were the control diet supplemented with 200,400 and 600mg/kg clove oil respectively. The diets were prepared freshly each day. Results showed that chicks fed on 600mg/kg clove oil recorded more in feed intake and body weight compared to both control and antibiotic groups ,but this increase was not significant ( $p < 0.05$ ). For feed conversion ratio (FCR) and body weight gain (BWG) chicks fed on diet with antibiotic recorded numerically the best value. Chicks fed on diets contain clove oil recorded the lowest rate of mortality compared to control group.

**Key words:**

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### INTRODUCTION

The usage of antibiotic is possibly the most important factor that promotes the emergence, selection and dissemination of antibiotic resistant microorganisms in both veterinary and human medicine (Castanon, 2007).But, the use of antibiotic growth promoters has been banned by the European.

Union (Castanon, 2007). As a result, new commercial additives of plant origin, considered to be natural products. Essential oils have been considered natural antibiotic alternative growth promoters to their antimicrobial (Valero and Salmeron, 2003), antioxidant (Dragland *et al.*, 2005) effects and their stimulating on animal performance (Ciltic *et al.*, 2005), and digestive enzymes (Lee *et al.* 2003; Jamroz and Kamel 2002) and improve utilization of digestive products through enhanced liver function (Langhout, 2000; Hernandez *et al.*, 2004). Eugenol is asbstance found in clove oil that has antimicrobial (Ehrch *et al.*, 1995) properties, an antifamatory, flavoids that boot its anti-inflammatory abilities.

Clove oil has been used in food products, perfumery in addition, antiseptic and digestion stimulant (Kamel, 2001), strong antimicrobial and antifungal (Ehrch *et al.*1995), an algesic and anti-inflammatory (Feng *et al.*, 1987) anesthetic and anticarcinogenic (Prasad *et al.*, 2004), antiparasitic and antioxidant (Dragland *et al.*, 2005) activities of clove and its ingredients have been reported.

### MATERIAL AND METHODS

The experiment was carried out during summer season from 31/3/2010 to 8/5/2010 in an ambient temperature ranging between 25-40 c in an open system .at the Poultry Farm of College of Agricultural Studies – Sudan University of Science and Technology. 105 unsexed 7 day old broiler (Ross308) were selected and divided into five treatment A,B,C,D,E groups and 21 birds each group was subdivided into three replicates and seven of chicks per each replicate .The experimental groups were fed as follows: Group A was the control diet, diet B (A+antibiotic), diet C, D and E were supplemental with 200, 400, 600 mg/kg of clove oil respectively .The diet were prepared fresh by each day .clove oil was dissolved in vegetable oil, which was used as fat source , and then gently mixed with the standard diets. Antibiotic was mixed carefully with the standard diets. The ingredients of control diet presented in table 1.

Feed intake, body weight were measured weekly. Weigh gain and FCR were calculated weekly .the mortality was recorded daily. Data collected were subjected to analysis of variance, and where significant differences were observed. Means were further subjected to Duncan's multiple range tests (1955).

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**Table 1:** Percent inclusion rate (by weight) of dietary Ingredients used in the experiment

Treatments Ingredients	Control (A)
Dura	62.0
Groundnut cake	30.61
Supper conc.*	5.0
Shell	0.5
DCP	0.5
DL-Meth. 98%	0.14
Vegetable oil	1.0
Salt	0.25

## RESULTS AND DISCUSSION

The effect of clove oil and antibiotic on the broiler performance is presented in Table 2. Results obtained showed no significant ( $P < 0.05$ ) difference for chicks performance, but chicks fed on diet supplemented with 600mg/kg clove oil showed numerically more in feed intake and body weight compared to both control and antibiotic groups. Also the addition of 600mg/kg clove oil to diets was improved weight gain compared to control group by about 2.24% and feed intake by 54.79% and approximately by 12 % compared to antibiotic. For FCR chicks in group C (200mg/kg clove oil) recorded the best values in the fourth week, and group E (600mg/kg clove oil) recorded the value in the fifth week compared to other tested groups. These differences among the groups in parameters may be due to active ingredient such as eugenol, which has digestive stimulating effect on the digestive system. (Cabuk *et al.* 2003). Clove oil also is a natural antibacterial, antiviral and antifungal agent (Valero and Salmeron, 2003; Singh *et al.*, 2002; Pina Vaz *et al.*, 2004), antiparasitic (Kim *et al.*, 2004). The improved in feed intake in 400mg/kg clove oil could be due to these positive effects of clove oil on the digestive system and high concentration of essential oil besides that clove oil is super-rich in manganese, trace minerals necessary for protein and carbohydrate metabolism, the synthesis of fatty acids and cholesterol and contain in lesser amounts, omega-3 fatty acids, vitamin C and K. These results were inline with those of (Osman *et al.* 2005; Alcicek *et al.*, 2003) in which different essential oils were added to poultry diets which improved feed intake and FCR and carcass yield.

In conclusion clove oil can be used up to 600mg/kg as an alternative natural growth promoter substance instead of antibiotic.

**Table 2:** Average performance of chicks fed on diets Supplemented with clove oil.

Item	Control (A)	A+ Neomycin (B)	A+200mg/kg clove oil (C)	A+400mg/kg clove oil (D)	A+600mg/kg clove oil
Initial weight g/bird	196.43	194.05	192.38	193.1	2.6
Final body weight g/bird	1266.76	1185.6	1233.02	1200.6	1268.0
Feed intake g/bird	4273.11	4226.456	4300.47	4043.16	4333.59
Body weight gain g/bird	2178.29	2148.78	2157.57	2065.76	2227.0
Feed conversion ratio	1.96	1.97	1.99	1.96	1.95
Total cost	18844.2	1875.2	1847.0	1849.79	1852.8
Total Revenue	2116.0	2271.0	2101.0	2158.5	2229.8
Profit	2.27	2.96	2.54	3.09	3.77

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