

Effect of Supplemented Black Seed (*Nigella Sativa*) on
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Effect of Supplemented Black Seed (*Nigella sativa*) on Growth Performance and Carcass Characteristics of Broilers

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Abstract: This study was conducted to investigate the effect of dietary supplementation with black seed on the performance in broilers. A total number of 120, 1 day old broiler chicks (Ross 308) were randomly allocated 4 treatments with 3 replications. The experiment lasted for 6 weeks. The dietary treatments consisted of the basal diet as control, 3, 5 and 7% black seed added to the basal diet. Body weights and feed intake of broilers were measured weekly. As a result, supplementing black seed did not have significant effect on broiler body weight, feed consumption and carcass characteristics. However, it can be concluded that feeding low levels of black cumin seed tended to improve performance characteristics in terms of body weight, feed consumption and carcass characteristics. The black cumin seed may reduce lipoidosis in the broilers.

Key words: Broiler, black seed, growth, carcass, body weight, Turkey...

INTRODUCTION

Using antibiotics as growth promoters in poultry diet has been prohibited by many countries due to residual side effects and growing resistance to antibiotics of disease causing bacteria in humans (Baserisalehi *et al.*, 2007; Sepchri and Abbass-Zadeh, 2006). Thereby, researchers focused on the use of natural plant extracts as supplements alternative to antibiotics to control disease in growing birds and positive results were observed (Jamroz and Kamel, 2002; Nobakht *et al.*, 2012).

Medicinal plants such as Black cumin seeds (*Nigella sativa*) were recommended as a non-antibiotic growth promoters (Harzallah *et al.*, 2011; Al-Beitawi *et al.*, 2009; Guler *et al.*, 2006). Black seed plant (*Nigella sativa*) which belongs to Ranunculaceae family is present in Turkey and Middle East countries capaciously. The main active components of black seeds include such as thymoguinone, thymol and carvacol which are important pharmacologically active substances (Harzallah *et al.*, 2011; Toghyani *et al.*, 2010; Nasir *et al.*, 2005). Therefore, it contains antibacterial (Nickavar *et al.*, 2003), defense regulator, antimicrobial (Harzallah *et al.*, 2011) natural antioxidant (Abdel-Zaher *et al.*, 2011) and liver protector properties with no side effects (Kanter *et al.*, 2003; Qusti and El-Sawi, 2007; Cetin *et al.*, 2008). Furthermore, the previous studies in this regard had in one assent reported that Black cumin seed contain a mixture of essential fatty acids partially, linoleic, linolenic and oleic

acids which cannot be synthesized in the body (Harzallah *et al.*, 2011; Guler *et al.*, 2006). As a consequence of this condition, black seed plant (*Nigella sativa*) appear to be potential multipurpose feed growth promoter and may be promising in improving broiler performance, particularly feed efficiency weight gain and immune system (Al-Beitawi and El-Ghouscin, 2008; Khalaji *et al.*, 2011; Cetin *et al.*, 2008; Abu-Dieyeh and Abu-Darwish, 2008).

This study was mainly designed in order to evaluate the effect of the inclusion of different levels of *Nigella sativa* rations on body weight, feed consumption, feed conversion ratio and carcass characteristics of broiler chicks.

MATERIALS AND METHODS

About 120 days old broiler chicks (Ross 308) were divided into 4 equal treatment groups, each with 3 replications (cages) of 10 chicks per cage. The experiment lasted 7 weeks. An adjustment period of 1st week was provided and the treatments were practiced for a period of 6 weeks. A basal diet (starter and grower) of corn, wheat, soybean and sunflower meal containing adequate nutrients was formulated. The diets were prepared for izonitrogenic and izocaloric. Before inclusion in feed, NS seeds were grounded to powder form. Birds in control groups (C) were fed basal diets and received water without any supplementation (Group IV). The treatment

Table 3: The effect of dietary Black cumin seed on carcass characteristics of broilers

Traits	Groups			
	I	II	III	IV
Carcass characteristics (g)				
Thigh	447.21±21.94*	482.78±21.94*	438.16±23.63*	478.83±23.63*
Breast	565.03±40.82*	617.81±40.82*	596.50±43.97*	588.16±43.97*
Ridge	321.10±20.81*	362.90±20.81*	340.50±22.42*	336.16±22.42*
Wing	174.84±8.880*	195.87±8.880*	192.16±9.570*	194.66±9.570*
Neck	99.43±6.370*	108.99±6.370*	95.66±6.860*	100.83±6.860*
Gizzard	35.54±2.200*	31.99±2.200*	37.51±2.370*	34.11±2.370*
Abdominal fat	9.96±3.680*	10.03±3.680*	12.16±3.970*	27.50±3.970*

I: 3%, II: 5%, III: 7% powdered Black cumin seed, IV: Control group. **Means within the same row with no common superscript differ (p<0.05)

Table 4: The effect of dietary Black cumin seed on Ascites Syndrome of broilers

Traits	Groups			
	I	II	III	IV
Heart (g) (Right ventricular)				
F	25.67±2.38	26.58±2.92	26.59±2.38	25.42±1.98
M	24.81±2.44	26.40±2.04	25.04±2.44	26.47±2.63
F-M	25.27±1.68	26.52±1.69	25.89±1.68	25.68±1.57
Left ventricular				
F	67.14±1.89	66.60±2.31	66.43±1.89	67.53±1.57
M	67.73±1.89	66.82±1.58	67.93±1.89	66.71±2.04
F-M	67.42±1.32	66.69±1.32	67.04±1.23	67.33±1.23

I: 3%, II: 5%, III: 7% powdered Black cumin seed, IV: Control group

The average abdominal fat weights in the 1st, 2nd and 3rd groups were determined as 9.96, 10.03 and 12.16 g, respectively. There was not any significant effect of Black cumin seed determined on the Ascites Syndrome.

DISCUSSION

In this study, it was observed that the Black seed has no positive or negative effect on growth, feed consumption and carcass characteristics. In agreement with the present study Cetin *et al.* (2008) and Toghyani *et al.* (2010) reported that body weight, feed consumption and carcass characteristics were not significantly affected from dietary Black cumin seed extract. The results of Abu-Diyyeh and Abu-Darwish (2008) experiment illustrate clearly positive effects of feeding powdered Black cumin (*Nigella sativa* L.) seeds on growth rate, feed intake, feed to gain ratio and mortality rate of broiler birds. Similarly, These results were in agreement of the results obtained by Guler *et al.* (2006), Al-Beitawi and El-Ghousein (2008), Al-Beitawi *et al.* (2009), Halle *et al.* (2004) and Khalaji *et al.* (2011) in broiler and Yalcin *et al.* (2010) in layers. Besides, in an experiment, no significant effect of 1% supplemented *Nigella sativa* on BWG and FCR was observed, however, combined application of NS and EP has shown a positive effect in terms of better (nearly significant) LBW on 35th day, total WG and ADWG. The researchers interpreted that obviously, there is a potential of synergism in enhancing broiler performance (Nasir and

Grashorn, 2010). Observing lack of the supplements on BW might relate to the managerial and feeding conditions and composition of basal diets. The diets were freshly prepared and did not have high amount of feed ingredients, so that the growth of mildew like aflatoxin and some pathogenic bacteria in intestine may have been limited. Lee *et al.* (2003) reported that usually it may be expected, that growth promoting effects of feed additives (antibiotic as well as non-antibiotic) become more apparent when birds receive less digestible diets and/or are kept in a less clean environment. It is also known that well-nourished healthy chickens don't respond to antibiotic supplements provided they are housed under clean and disinfected conditions. In present experiment, there was no or little room to prevent their growth performance. Observing reduced mortalities in supplemented powdered Black cumin seed treated groups as compared to control may indicate that powdered Black cumin supplementation has potential to improve health and immunity of the birds and reducing mortality and morbidity. In the first part of this experiment, supplementing 3, 5 and 5% Black cumin in broiler diets has been reported to strengthen immune system by preventing lipid peroxidation and liver damage (Sogut *et al.*, 2008). In present experiment, reduction in mortality might show that NS seeds possess potential to improve immunity alone.

In this experiment the weights of thigh, breast, ridge, wing and neck from carcass characteristics, the weights of gizzard and heart from edible internal organs and abdominal fat weights are examined. The weight of heart ventricular is examined in order to determine whether the black seed has an effect on the Ascites which is a serious problem on broiler raised in high altitude. There was no significant difference observed. Generally, except the abdominal fat weights, the black seed had no significant effect on carcass characteristics. Similarly, Al-Beitawi and El-Ghousein (2008), Halle *et al.* (2004) and Toghyani *et al.* (2010) reported that supplementation with Black cumin seed did not have significantly affect carcass

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