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EFFECT OF FENUGREEK (*TRIGONELLA FOENUM-GRAECUM*) LEAVES POWDER ON VISCERAL ORGANS OF BROILER CHICKS

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ABSTRACT

The purpose of this research work was to evaluate the fenugreek leaves powder on the visceral organs of broiler chicks. Seventy two, day old broiler chicks were randomly assigned to four treatments T_1, T_2, T_3 and T_4. Each treatment was replicated three times with six chicks per replicate. Treatment T_2, T_3, T_4 received the leaves powder of Fenugreek @ 0.25%, 0.50% and 0.75%, respectively while group T_1 served as a control. Liver weight, heart weight, gizzard weight, intestine weight and thigh weight was not significant in any treatment, however, it was higher in treatment T_3 and T_4. The leg weight and breast weight was significant higher in @ 0.75% group T_4 as compare to control. It was concluded from this study that leaves powder of Fenugreek has amply good effect on the weight on visceral organs which are second to none in importance in both taste and popularity among the people.

KEYWORDS: Broiler, Fenugreek, Visceral organ, Liver and Heart.

INTRODUCTION

Feed is a major component, affecting net return from the poultry business, because 80% of the total expenditure in terms of cash is spent on feed purchase (Khan et al., 2010). To ensure more net return and to minimize high expenditure on feed are the main challenges, for which many research strategies have been practiced such as introducing feed supplements and feed additives (Khan et al., 2009). In the past the major growth promoters were antibiotics. However the current research is looking for natural alternative to antibiotics because of their residue and subsequent resistance to bacteria. At present the scientists are working to improve feed efficiency and growth rate of livestock using useful herbs (Khan et al., 2010). Fenugreek (*Trigonella foenum-graecum L.*) a well known medicinal plant grows in nature and is cultivated in India and Pakistan. It is having properties of lowering blood sugar level, anthelmentic, antibacterial, anti-inflammatory, antipyretic, and antimicrobial (Ahmadiani et al., 2001; Khan et al., 2009). It contains minerals, B.Complex, iron, Phosphates, PABA (Para- Amino Benzoic Acid), vitamins (A, D), lecithin and choline that help to dissolve cholesterol and fatty substances (Dixit et al., 2005). It also contains neurin, biotin, trimethylamine which tends to stimulate the appetite by their action on the nervous system (Michael and Kumawat, 2003). There is limited evidence about whether the inclusion of aqueous extract would have growth promoting effect on live birds. Therefore, in conducting the current experiment, an approach was taken so that the results could have practical application. If the experiment was successful, the use of aqueous extract would be helpful to reduce the feedcosts involved in broiler production. To the best of our knowledge the aqueous solution of fenugreek (*Trigonella foenum-graecum L.*) seeds on the carcass quality has not been reported. The present study was conducted to describe the effect of aqueous extract of fenugreek (*Trigonella foenum-graecum L.*) as a growth promoter supplementation on growth performance of breast, thigh and leg weights which are the major parts of muscles in broilers.

MATERIALS AND METHODS

A total of 72 DOC of same hatch were randomly distributed into four groups i.e. T_1 (Control), treatment T_2, T_3 and T_4 with six sub groups comprising of three birds in each.

Table 1 Ingredient and nutrient composition of experimental diet (%DM)

Ingredients (%)	Broiler starter (0 – 21 days)	Broiler finisher (22 – 42 days)
Maize	60.00	63.00
Ground nut cake	23.11	18.00
Fish meal	13.00	15.00
Mineral mixture	3.00	3.00
Common salt	0.22	0.33
Vitamin premix (vit. A,B_2 ,D_3)	0.02	0.02
TM – 100	0.10	0.05
Amprosol	0.05	0.05
Nuvimin	0.05	0.55
Nutrient composition		
Moisture (%)	6.29	6.22
Crude Protein (%)	23.29	21.28
Total Ash (%)	8.02	9.34
CP	22.00	19.00
ME (Kcal/Kg)	2900	3000

Broilers in T_1 were fed diet as per NRC (1994) standard (CP 22 and ME 2900) but broilers in T_2, T_3 and T_4 were fed standard ration supplemented with 0.25, 0.50, 0.75 percent fenugreek leaf powder. All broilers were offered feed and water adlib all time. They were housed in metal type battery cages in small animal laboratory of S.S. and AH Dairying, SHIATS Allahabad. A bulb of 15 watt was left on in each cage. Initial weight of each chick was recorded on arrival and then weekly. The experiment lasted for 35 days. At the end of experiment, randomly selected 20 birds from each group were killed humanely. Internal organs were separated including abdominal fats and neck in such a way that only the solid muscular portion remained. Breast, leg, thigh, liver, heart, intestine and gizzard weight of each bird were weighed on a wing balance on fresh basis. Data obtained on various parameters were tabulated and statistically analyzed using analysis of variance (ANOVA) technique as per Snedecar & Cocharan (1994) in RBD.

RESULTS AND DISCUSSION

The results of this experiment show clearly a positive effect of Trigonella foenum-graecum on the weight of the breast, leg, liver, heart, gizzard, intestine and thigh of broiler chicks. Means leg weight is presented in Table 2.Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate was incorporated into the basal diet for five weeks., showed higher ($P<0.05$) leg weight (71.06 g) as compared to other treatment groups. Our findings are similar to Ibrahim et al. (1998) in broilers and Ghazalah and Ibrahim (1996) in ducks, who reported that adding fenugreek to the control diet at a level of 1000g/ton improved live body weight. The present increase in muscle weight may be due to the antioxidant property of this plant which increases digestive enzymes and decreasing bacterial activities and thus result in body weight gain in broiler chicks (Dixit et al., 2005; Khan et al., 2009). After many research studies on animal and human being, Dixit et al. (2005) reported that fenugreek seeds powder improved metabolism. Therefore, there is likelihood that improved metabolism has beneficial impact on weight gain of the studied muscles. Comparative higher weight of breast, leg and thigh in group C is attributed to the nutritive effect of fenugreek (*Trigonella foenumgraecum L.*). Gomez et al. (1998) concluded that the improvement in live body weight in broilers may be due to antibacterial related to flavonoids in fenugreek that led to maintaining normal intestine microflora by competitive exclusion and antagonism, altering metabolism and increased liver and muscle glycogen contents. Means breast weight is presented in Table 2.

Table 2. Mean±SE liver weight, heart weigh, gizzard weight, intestine weight, leg weight, breast weight and thigh weight in broiler chicks diet with supplementation of fenugreek leaves powder.

Treatment	Liver weight (g)	Heart weight (g)	Gizzard weight (g)	Intestine weight (g)	Leg weight (g)	Breast weight (g)	Thigh eight (g)
Control(T_1)	26.61± 0.3	10.04±0.7	42.22±1.3	94.55±0.2	65.46±1.8[a]	258.67±1.5[a]	59.55±1.1
0.25 %(T_2)	27.24± 0.1	10.14±0.4	42.30±1.5	94.92±0.3	67.81±1.1	261.30±1.6	61.99±1.2
0.50 %(T_3)	27.58± 0.7	10.16±0.2	42.47±1.1	95.61±0.9	67.93±1.5	268.81±1.1	62.81±1.6
0.75% (T_4)	28.04±1.2	10.49±0.9	42.46 ±1.9	95.75±1.4	71.06±1.8[b]	274.32±1.0[b]	64.09±1.7

ab means in the same column with no common superscript differ significantly ($P\leq0.05$).

Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed significant higher breast weight (274.32 g) between treatment. Means liver weight is presented in table 2. Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed non significant higher in liver weight (28.04 g). Means heart weight is presented in table 2. Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed non significant higher in heart weight (10.57 g). Means gizzard weight is presented in

table 2. Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed non significant higher in gizzard weight (28.04 g). Means intestine weight is presented in table 2. Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed non significant higher in intestine weight (95.75 g). Means thigh weight is presented in table 2. Treatment T_4 receiving 0.75 % fenugreek leaves powder at the rate were incorporated into the basal diet for five weeks showed non significant higher in thigh weight (64.09 g). Results of our findings is in contrast with the findings of Gautam et al. (2004), who noticed that no significant effect on visceral organ weight was observed, fed *Withania somnifera* to the animals. In this experiment, we obtained better weight in terms of breast, leg and thigh in experimental group having treated with 0.75 % fenugreek leaves powder of Fenugreek. In conclusion it can be said that 0.75 % fenugreek leaves powder of fenugreek (*Trigonella foenum-graecum L.*) was produced positive results in broiler chicks. It may also decrease the market age of broilers and reduce their rearing cost.

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