
Effect of Dietary Supplementation of Fenugreek (*Trigonella foenum graecum L.*) Seeds Powder on the Performance of Feed Consumption and Feed Conversion Ratio in Commercial Broilers

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ABSTRACT

The present study a total of 72 day old chick of male broiler hatch were procured and randomly distributed into four groups. Treatment T_1 is control and treatment T_2 , T_3 , and T_4 with six sub groups comprising of two birds in each to serve as replicates. Broilers in treatment T_1 was fed diet as per NRC standard CP 22 and ME 2900 but broilers in T_2 , T_3 and T_4 were fed standard ration T_1 supplemented with 0.25, 0.5, 0.75 present FSP adlib. The mean body weight of broiler in different treatment T_1 , T_2 , T_3 and T_4 were 1236.39gm, 1298.61gm, 1303.38gm and 1314.44gm respectively and give significant effect among that treatment. The mean feed intake of broilers at five week of age in T_1 , T_2 , T_3 , and T_4 were 1870.0gm, 1889.65gm, 1921.65gm and 197.65gm respectively and give non-significant effect among that treatment. The mean feed consumption ratio of broiler at five week of age in T_1 , T_2 , T_3 and T_4 were 1.69kg, 1.43kg, 1.67kg, and 1.69kg respectively and among that treatment give non-significant effect. It was concluded that treatment T_4 give high feed intake, and high feed consumption ratio (FCR) per broiler among those treatments.

Keywords:- Fenugreek (*Trigonella foenum graecum L.*), Feed conversion ratio (FCR), Day old chicks (DOC), Electronic weighing machine, feed-supplemented probiotics (FSP), National research council (NRC).

INTRODUCTION

Indian economy majorly contributed by livestock and poultry sector. Poultry rearing is one of the most suitable activities to improve the livelihoods of the poor people due to the advantage that it requires small amount of capital and the relative ease to set-up such a production system in the rural communities. The broiler industry is growing at the rate of 12-15 per cent per annum during last few years. The total poultry production in country is 729.2 million. The recent trend in the feed supplement is directed toward the use of natural ingredients as alternatives to antibiotics, synthetic colors and other chemicals. Feed additives are added to broilers diet to improve its productive performance by increasing growth rate, better feed conversion efficiency and greater livability in poultry birds. Leafy vegetables seed powder as an additive in the diet of chickens is very common.

Fenugreek (*Trigonella foenum-graecum L.*) is a well-known medicinal plant that grows in nature and mainly cultivated in India, Pakistan and china. Fenugreek seeds have many therapeutic effects like hypoglycemic, anti-diabetic, anti-fertility, anti-cancer, anti-parasitic, anthelmintic, antibacterial, anti-inflammatory, antipyretic, and antimicrobial properties [1]. It contains neurin, biotin and trim ethylamine which tends to stimulate the appetite by their action on the nervous system [2]. Since long Fenugreek is being used as a growth promoter

particularly in the diet of broiler chicken. Inclusion of Fenugreek seeds in the diet significantly improves the body weight of broiler chicken [3,4,5]. Further, it improves the feed efficiency with reduction in feed cost when used as natural feed additive in broiler chicken diet [6]. There are numerous feed additives of plant origin that are used in broiler feeds to improve the performance by enhancing growth rate, better feed conversion efficiency and lower mortality

Seeds of Fenugreek (*Trigonella foenum-graecum* L.) is reported to have many therapeutic effects such as hypoglycemic, hypocholesterolaemic, anthelmintic, antibacterial, anti-inflammatory, antipyretic and antimicrobial properties [1, 7]. Fenugreek seeds contain neurin, biotin and trimethylamine which tend to stimulate the appetite by their action on the nervous system [8]. Alloui *et al.* (2012) reported that 0.3% fenugreek had positive effects on growth performance of broiler chick where as Abbas (2010) found negative effects on feed intake and no effect on live weight. Apart from a range of beneficial effects including growth promoting, having 24 % CP and 3819 (ME) Kcal/Kg of energy and rich in vitamins and minerals, fenugreek can be regarded as a nutritious feed ingredient as well [9, 10]. El-Mallah *et al.* (2005) reported that 2% fenugreek in diets of turkey chicks significantly increased the digestibility of nitrogen free extract due to saponin present in fenugreek [11]. Meanwhile, Al-Habori *et al.* (1998) found that fenugreek reduced the plasma cholesterol levels of rabbit [8].

Objective of this study was to determine the effects of a range of dietary fenugreek seed powder on weekly feed consume and weekly feed consumption ratio (FCR) performance of commercial broiler chicken

MATERIAL AND METHOD

A total of 72 DOC broiler chick of same hatch were procured and randomly divided into four groups with six sub group comprising of 3 chicks in each to separate as replicates with the following dietary regimes as treatments:

T₁ (Control) Ration with no *Trigonella foenum- graecum* L

T₂ Ration with 0.25% *Trigonella foenum- graecum* L

T₃ Ration with 0.50% *Trigonella foenum- graecum* L

T₄ Ration with 0.75% *Trigonella foenum- graecum* L

The birds were reared in battery type cage under standard management practices from day old to five week of age. Dried *Trigonella foenum- graecum* L seeds powder was supplemented as per dietary regimes of treatment. Broiler starter ration contained CP: 22 percent and ME: 2900 K cal/kg feed and broiler finisher ration contained CP: 19 percent and ME: 3000 K cal/kg was fed ad libitum to the birds. Initial weight of each chick was recorded on arrival and then weekly to obtain the growth rate. The feed consumption was also recorded weekly to determine the feed conversion rate. The mortality rate was also recorded during the experiment period.

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	23.35	18.00
Fish meal	13.00	15.00

Mineral mixture	3.00	3.00
Common salt	0.50	0.38
Vitamin premix (Vit. A, B ₂ , D ₃)	0.05	0.02
Amprosol	0.05	0.05
Nuvimin	0.05	0.55
Nutrient Composition		
Moisture (%)	6.29	6.22
Crude protein (%)	22.0	19.0
Total Ash (%)	8.02	9.34
Crude fiber (%)	5.5	6.0
ME (Kcal/kg)	2900	3000

The data on various parameters were collected tabulated and statistically analysis of variance (ANOVA) technique as per Snedecor & Cochran (1994) in Random Block Designed.

RESULT AND DISCUSSION

Statistically significant different ($P < 0.05$) in respect to Fenugreek level was found to have influence on average weekly feed consumption of broiler and average weekly feed consumption ratio (FCR) among the experimental group of broiler.

A) Average Weekly Feed Intake of Broilers

The data regarding body weight of the chicks randomly distributed into control T₀ and four different treatments T₁, T₂, T₃ and T₄ were observed weekly. At first week of age the highest intake of broiler was recorded in T₄ (173.67g) followed by T₃ (162.17g), T₂ (162.00g), and T₁ (149.00g) and Second weeks of age the highest intake of broilers was recorded in T₄ (285.00g) followed by T₃ (285.33g), T₂ (277.50g) and T₁ (263.00g). Third weeks of age the highest intake of broiler were recorded in T₄ (449.50g) Followed by T₃ (444.17g), T₂ (437.50g), and T₁ (415.33g). At fourth weeks of age the highest intake of broilers were recorded in T₄(498.17g) followed by T₃ (457.50g), T₂ (449.83g) and T₁ (405.50g). At five weeks of age the highest intake of broiler were recorded in T₄(599.00g) followed by T₃ (595.83g) T₂ (580.17g) and T₁ (573.33g). Irrespective of treatments the mean feed intake of broilers in first week, second, third, four and five week of age were 173.67g, 285.00g, 449.50g, 498.17 and 599.00g respectively and the different in this value were non-significant effect. When treatment wise feed intake of broiler were observed it was noted that highest weekly mean feed intake of broiler were recorded in T₄ (599.00g) followed by T₃ (595.83g) T₂ (580.17g) and T₁ (573.33g). The differences in these values of treatments were also found significant indication a significant effect of treatment feed intake of broiler. Among T₂ and T₃ was non-significant being at par as shown in figure no. 1.

B) Average Weekly Feed Conversion Ratio Per Broiler

The data regarding feed conversion ratio of broiler randomly distributed into control (T₀) and four different treatments (T₁, T₂, T₃, and T₄). The following observation were at one week of age the highest feed conversion ratio per broiler were recorded in T₂(1.88kg) followed by T₁(1.99kg), T₄(2.06kg), and T₃(2.18kg). Two weeks of age the highest feed conversion ratio per broiler were recorded in T₁ (1.90kg) followed by T₄ (1.96kg), T₂ (1.97kg), and T₃ (2.02kg) and three weeks of age T₁ (1.35kg) followed by T₂ (1.46kg), T₃ (1.50kg) and T₄ (1.52kg). At four weeks of age the highest feed conversion ratio per of broiler was recorded in T₃ (1.29kg) followed by T₂ (1.42kg), T₄ (1.49kg) and T₁ (1.53kg). At five week of age T₃

(1.41kg) followed by T₁ (1.45kg), T₂ (1.45kg) and T₄ (1.48kg). In respective of treatments the mean feed conversion ratio of broilers in first second, third, four and fifth week of age were 1.88kg, 1.90kg, 1.36kg, 1.29kg and 1.41kg respectively and the different in this value were non-significant effect. When treatment wise feed conversion ratio in broiler were observed it was noted that highest weekly mean feed conversion ratio of broiler were recorded in T₂ (1.43kg) followed by T₁ (1.64kg), T₃ (1.67kg) and T₄ (1.69kg). The differences in these values of treatments were also found non-significant effect of treatment on feed conversion ratio of broilers shown in figure no. 2

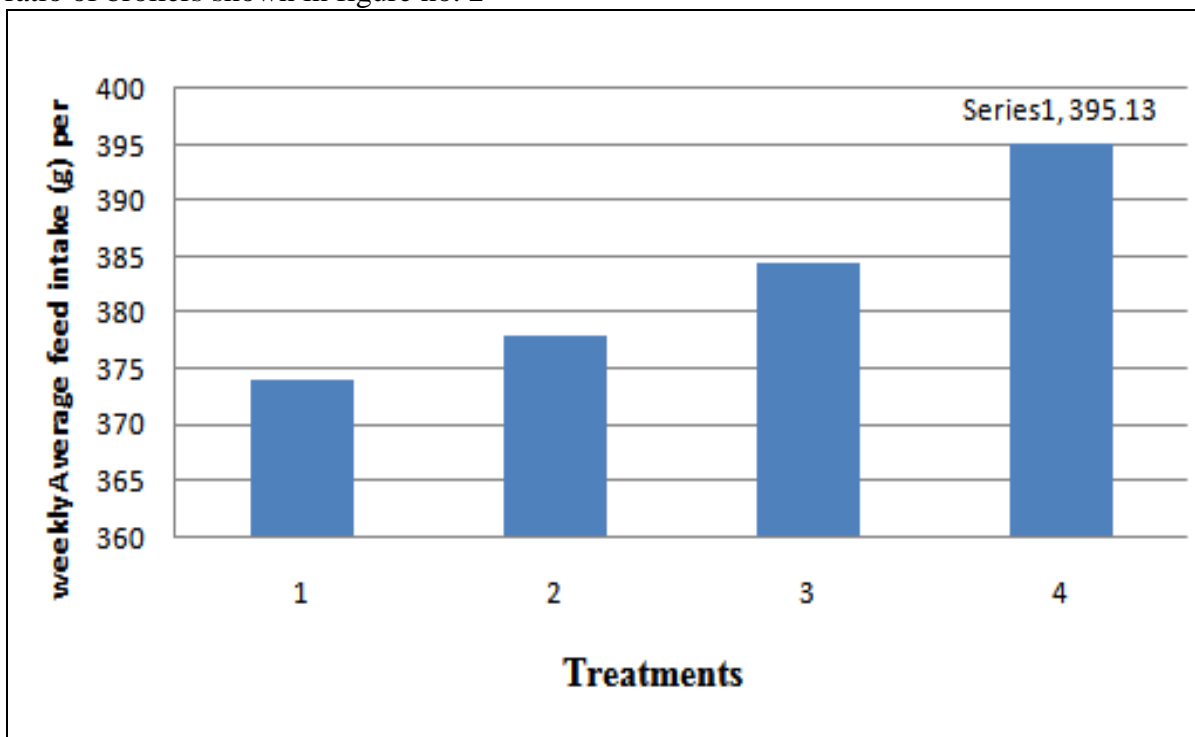


Fig. 1 Weekly Average feed intake (g) per broiler in four different treatments

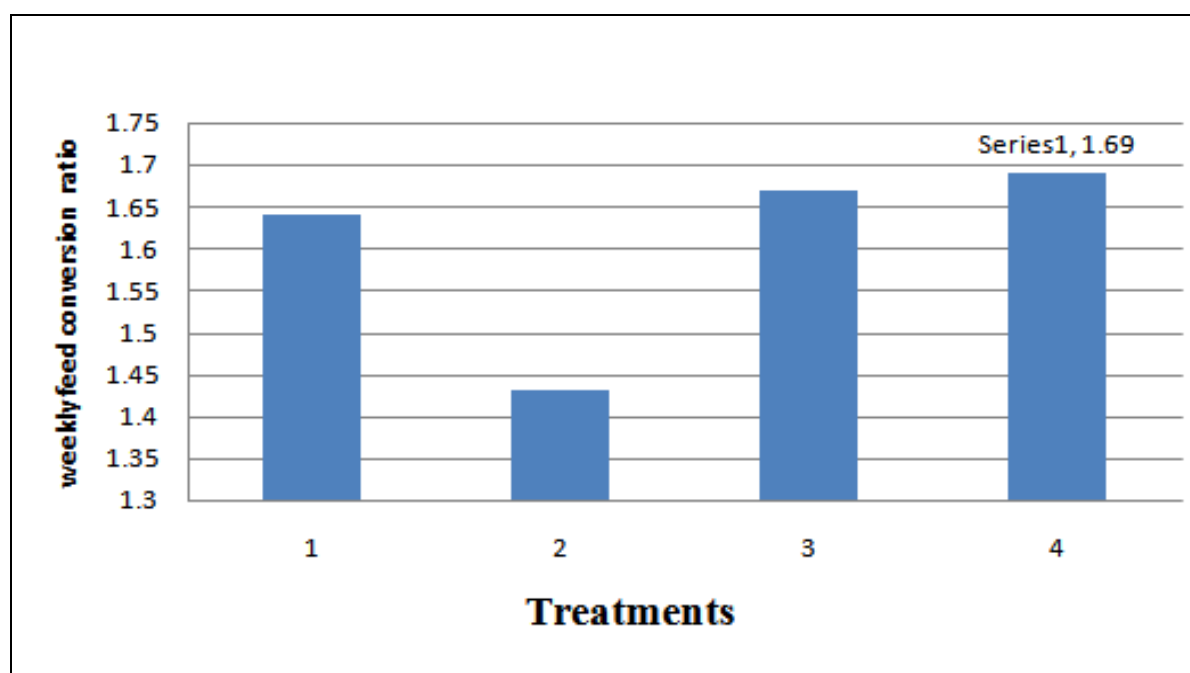


Fig. 2 Weekly feed conversion ratio per broiler in four different treatments:

The results were summarized that mean feed intake per broiler in T₁, T₂, T₃, and T₄ during five week of age were 1870gm, 1889.65gm, 1921.65gm, and 197.65gm respectively and the different in feed intake of broilers between treatments were non- significant. On the other hand mean feed conversion ratios of broilers in T₁, T₂, T₃ and T₄ during five week of age were 1.64kg, 1.43kg, 1.67kg and 1.69kg respectively. Differences in FCR of broilers between treatments were non- significant effect.

Table 1: Mean Value Parameters Supplemental Fenugreek Seed Powder of Body Weight, Feed Intake and Feed Consumption Ratio in Commercial Broilers

Parameters	Treatments				Results
	T ₁	T ₂	T ₃	T ₄	
Body weight at five week of age (kg)	1.23 ^a	1.29 ^a	1.30 ^a	1.31 ^b	S
Feed intake per broiler (kg)	1.87 ^a	1.88 ^a	1.92 ^a	1.97 ^a	NS
FCR (kg)	1.64 ^a	1.43 ^a	1.67 ^a	1.69 ^a	NS

CONCLUSION

It is concluded that there was a significant effect of Fenugreek seed powder supplementation in feed of broilers on body weight and gain in weight. But feed intake per broiler and feed consumption ratio per broiler were non-significant effect was observed. The feed contained 75% (T₄) Fenugreek seed powder were observed the best result to improved body weight, feed intake per broiler and feed consumption ratio per broiler.

REFERENCES

- 1) Bash E, Ulbricht C, Kuo, G, Szapary P et Smith M (2003). Therapeutic Applications of Fenugreek. *Alternative Medicine Review*, 8: 20-27.
- 2) Al-Habori, M., Al-Aghbari, A.M. and Al-Mamary, M. (1998). Effect of fenugreek seeds and its extracts on plasma lipid profile: A study on rabbits. *Phytotherapy. Res.* 12, 572-575.
- 3) Abaza I.M. (2007). Effects of Using Fenugreek, Chamomile and Radish as Feed Additives on Productive Performance and Digestibility Coefficients of Laying Hens. *Poult.Sci*, 199-218.
- 4) Yattoo, M. A., R.K. Sharma, N. Khan, A. Rastogi, and A. K. Pathak (2012). Effect of Fenugreek and Black Cumin Seeds as Feed Additives on Blood Biochemical Profile and Performance of Broilers. *Indian J. Anim. Nutri.*, 29(2): 174-178.
- 5) Qureshi Saim., Bandy, M.T., Sheikh Adil., Irfan Shakeel and Munshi, Z.H (2015). Effect of Dandelion Leaves and Fenugreek Seeds With or Without Enzyme Addition on Performance and Blood Biochemistry of Broiler Chicken, and Evaluation of Their *in vitro* Antibacterial Activity. *Indian J. Anim. Sci.*, 85(11): 1248–1254.
- 6) Azoua H. M. (2001). Effect of Hot Pepper and Fenugreek Seeds Supplementation on Broiler Diets. Ph. D. Thesis, Submitted to Faculty of Agriculture, Alexandria University, Egypt.
- 7) Safaa, H.M. (2007). Effect of dietary garlic or fenugreek on cholesterol metabolism in laying hens. *Egypt Poult. Sci.* 27, 1207-1221.
- 8) Al-Habori, M. and Roman, A. (2002). Pharmacological properties in fenugreek- The genus *Trigonella*. Pp. 163-182. In: Petropoulos, G.A. (Ed.). Taylor and Francis, London and New York

- 9) Alloui, N., S. Ben Aksa, M. N. Alloui and F. Ibrir (2012). Utilization of Fenugreek (*Trigonella foenum-Graecum*) as Growth Promoter for Broiler Chickens. *J. World's Poult. Res.*,2(2): 25-27.
- 10) Abbas, R.J (2010). Effect of using fenugreek, parsley and sweet basil seeds as feed additives on the performance of broiler chickens. *Int. J. Poult. Sci.* 9, 278-282.
- 11) El-Mallah, G.M., Ibrahim, S.A. M. and. Abdo, M.A.Z. (2005). Garlic and fenugreek as feed additives to different levels of protein and energy in diets of growing turkeys. *Egypt. Poult.Sci.* 25, 911–929.