



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2019; 7(3): 1659-1661

© 2019 IJCS

Received: 07-03-2019

Accepted: 09-04-2019

Vishal Singh RathorePh.D. Scholar, Department of
Animal Nutrition, CVAS,
Bikaner, Rajasthan, India**Tribhuwan Sharma**Ph.D. Scholar, Department of
Animal Nutrition, CVAS,
Bikaner, Rajasthan, India**Neha Sharma**Ph.D. Scholar, Department of
Animal Nutrition, CVAS,
Bikaner, Rajasthan, India**Buddha Ram**Ph.D. Scholar, Department of
Animal Nutrition, CVAS,
Bikaner, Rajasthan, India

Effect of supplementation of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) on the performance of broiler chicks in arid region

Vishal Singh Rathore, Tribhuwan Sharma, Neha Sharma and Buddha Ram

Abstract

The present study was conducted to evaluate the effect of supplementation of effect of supplementation of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) on the performance of broiler Chicks. 300-day old Ven-Cobb 400 broilers chicks were randomly divided into 10 different dietary treatments as C *i.e.* control group was fed on basal diet while 0.50%, 1.0% and 1.50% of bael fruit powder and fenugreek seed powder in the basal broiler starter and finisher ration were supplemented in T₁, T₂, T₃ and T₄, T₅, T₆, respectively. The T₇, T₈, and T₉ treatment groups were supplemented with 0.25%, 0.50% and 0.75% of both bael fruit powder and fenugreek seed powder in combination in the basal broiler starter and finisher ration, respectively. No significant effect of supplementation of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) on mean value of performance index and protein efficiency ratio in broilers was observed.

Keywords: Bael, broilers, fenugreek, performance

Introduction

Poultry is the most organized sector in animal husbandry with estimated worth of one lakh crores. The growth is 6.8% in layers and 10-12 % in broilers per year against the growth of agriculture as a whole to be around 2.5 %. Live broilers became a separate food entity recently in last 10 years and improvement in efficiency of production system by research efforts has changed the shape of this industry (Kotaiah, 2016) ^[11]. The economics of poultry industry mostly depends upon the feeding and in order to increase the feed efficiency, growth rate and disease resistance for lucrative broiler production system. Feed additives are one of the important tools used for improving feed conversion ratio, growth rate and disease resistance. With the ban of antibiotics as additives in poultry diets in many countries, new feed additives of plant origin, have received great attention as possible antibiotic growth promoter replacements. They have antimicrobial, antioxidant effects and their stimulating effects on animal performance and digestive enzymes due to presence of secondary metabolites or active principles.

Among many herbal additives, one is *Aegle marmelos* (Bael) which has been used in ethnomedicine to exploit its medicinal properties including astringent, antidiarrheal, antidyenteric, demulcent, antipyretic and anti-inflammatory activities (Maity *et al.*, 2009) ^[12]. Another feed additive is *Trigonella foenum-graecum* (Fenugreek) which is reported to have anti-diabetic, anti-fertility, anti-cancer, anti-microbial, antiparasitic hypo-cholesterolaemic effects (Al-Habori and Roman, 2002) ^[3], hypoglycemic, anthelmintic, antibacterial, anti-inflammatory and antipyretic properties (Ahmadiani *et al.*, 2001; Basch *et al.*, 2003; Khan *et al.*, 2009) ^[2, 7, 10]. Many researchers reported that using medicinal plants in broiler diets improved body weight gain, feed conversion efficiency and reduced the cost of feed (Azoua, 2001; Abdel-Azeem, 2006; Khan *et al.*, 2009) ^[5, 10].

Hence, the the present investigation was undertaken to exploit the possibilities of dietary inclusion of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) as feed additive in broiler ration to improve performance index and protein efficiency ratio of broilers.

Correspondence

Vishal Singh RathorePh.D. Scholar, Department of
Animal Nutrition, CVAS,
Bikaner, Rajasthan, India

Materials Methods

300-day old Ven-Cobb 400 broilers chicks were procured from commercial reputed hatchery. Commercially available readymade broiler starter and broiler finisher feed were procured from store poultry farm, C.V.A.S., Bikaner. *Aegle marmelos*, (Bael) fruit powder and *Trigonella foenum-graecum* (Fenugreek) seed powder were procured from reputed firm of Bikaner (Rajasthan) in sufficient quantity. Ten different treatment diets were prepared for the feeding of broilers under different dietary groups as C *i.e.* control group was fed on basal diet while T₁, T₂, and T₃ treatment groups were supplemented with 0.50%, 1.0% and 1.50% of bael fruit powder in the basal broiler starter and finisher ration, respectively. The T₄, T₅, and T₆ treatment groups were supplemented with 0.50%, 1.0% and 1.50% of fenugreek seed powder in the basal broiler starter and finisher ration, respectively. The T₇, T₈, and T₉ treatment groups were supplemented with 0.25%, 0.50% and 0.75% bael fruit powder in combination with fenugreek seed powder @ 0.25%, 0.50% and 0.75% in the basal broiler starter and finisher ration, respectively. Weekly feed consumption and body weight was recorded on weekly basis. Performance index and Protein efficiency ratio values were calculated during each studied weekly growth period according to equations of North (1981) and Ali (1999) [6] respectively as follows:

$$\text{Performance Index (PI)} = \frac{\text{Body Weight Gain (g)}}{\text{Feed Conversion Ratio (FCR)}}$$

$$\text{Protein efficiency ratio (PER)} = \frac{\text{Body Weight Gain (g)}}{\text{Protein Consumed (g)}}$$

Results and Discussion

Performance index

The overall mean performance index calculated in terms of weight gain per unit of feed conversion ratio for C, T₁, T₂, T₃, T₄, T₅, T₆, T₇, T₈ and T₉ groups were found to be 1282.43, 1347.58, 1344.07, 1189.81, 1293.1, 1326.22, 1356.31, 1256.35, 1302.08 and 1376.61, respectively (Table 5.). Performance index was observed to be increased though numerically only, by supplementation of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) in broiler which might be due to higher body weight gain and better FCR. The results obtained in present study are in line with the findings of Das *et al.*, (2001), Al-Sultan (2003) [4], Rekhate *et al.*, (2010), Dwivedi (2013) recorded similar effects on performance index due to supplementation of herb in the poultry ration. These findings were disagreement with those of Prajapat (2016) [15] who recorded significant effect of supplementation of Fenugreek on performance index in broiler ration.

Protein efficiency ratio

The overall means of protein efficiency ratio in different treatment groups were found to be 2.69 in C, 2.83 in T₁, 2.8 in T₂, 2.64 in T₃, 2.72 in T₄, 2.74 in T₅, 2.81 in T₆, 2.64 in T₇, 2.75 T₈ and 2.81 in T₉. Improvement in protein efficiency ratio in Bael or Fenugreek group alone and in combination might be due to higher body weight gain and better feed intake by the broilers. The statistical analysis of data revealed non- significant effect of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) alone and in combination at different weeks on protein efficiency ratio during the experiment. These results obtained in study in text

corroborate well with the findings of Meena (2015) [13] and Singh (2014) [17] who also recorded no significant effect on protein efficiency ratio due to incorporation of herb in the diet of broilers.

Conclusion: Considering the results of study in text revealed improvement in performance index and protein efficiency ratio. Though, did not appear statistically proven suggested that Bael and Fenugreek could be potential feed additive. Thus, a long term feeding trial is required.

Acknowledgement

Authors are thankful to CVAS Bikaner for providing facilities in the poultry farm to pursue this experimental work.

Table 1: Effect of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) on Protein Efficiency Ratio at different weeks

Main effects	0-I	I-II	II-III	III-IV	IV-V	V-VI	I-VI
C	3.19 ^a	3.16 ^{ab}	2.99	2.7	2.54	2.5	2.69
T ₁	3.36 ^{ab}	3.18 ^{ab}	3.13	2.9	2.69	2.62	2.83
T ₂	3.35 ^{ab}	3.16 ^{ab}	3.01	2.81	2.67	2.6	2.8
T ₃	3.59 ^{abc}	2.91 ^a	2.88	2.69	2.52	2.44	2.64
T ₄	3.46 ^{abc}	3.29 ^{abc}	2.93	2.81	2.63	2.45	2.72
T ₅	3.86 ^{cd}	3.35 ^{bcd}	2.98	2.73	2.67	2.46	2.74
T ₆	4.04 ^d	3.7 ^d	2.93	2.89	2.69	2.5	2.81
T ₇	3.66 ^{bcd}	3.25 ^{abc}	3.00	2.8	2.44	2.29	2.64
T ₈	4.08 ^d	3.66 ^{cd}	3.02	2.84	2.49	2.44	2.75
T ₉	3.49 ^{abc}	3.28 ^{abc}	3.18	2.93	2.61	2.58	2.81
SEM	1.307	1.071	0.759	0.661	0.609	0.752	0.635

a, b, c, d- Means superscripted with different letters within a column differ significantly from each other

Table 2: Effect of *Aegle marmelos* (Bael) and *Trigonella foenum-graecum* (Fenugreek) on Performance Index at different weeks

Main effects	0-I	I-II	II-III	III-IV	IV-V	V-VI	I-VI
C	74.84 ^a	133.13 ^{ab}	210.75 ^{bc}	235.92	279.1	359.40	1282.43
T ₁	84.02 ^{ab}	127.84 ^a	210.50 ^{bc}	256.17	284.92	393.63	1347.58
T ₂	84.43 ^{ab}	131.96 ^a	199.21 ^{ab}	245.58	286.47	397.28	1344.07
T ₃	90.51 ^{abc}	109.33 ^a	185.96 ^{ab}	219.12	250.59	347.32	1189.81
T ₄	85.74 ^{abc}	132.02 ^a	192.56 ^{ab}	249.81	288.31	359.40	1293.10
T ₅	102.99 ^{cd}	134.99 ^{ab}	195.59 ^{ab}	241.90	302.37	368.62	1326.22
T ₆	108.93 ^d	158.74 ^{bc}	178.92 ^a	261.25	309.29	366.14	1356.31
T ₇	99.53 ^{bcd}	135.49 ^{ab}	211.45 ^{bc}	259.60	258.61	318.94	1256.35
T ₈	113.23 ^d	162.01 ^c	199.16 ^{ab}	254.07	243.72	363.55	1302.08
T ₉	83.09 ^{ab}	128.08 ^a	228.38 ^c	270.91	283.68	396.84	1376.61
SEM	1.355	1.095	1.084	0.68	0.672	0.632	0.536

a, b, c, d- Means superscripted with different letters within a column differ significantly from each other.

References

1. Abdel-Azeem, F. Effect of using Fenugreek and Fennel seeds as natural feed additives on performance of broiler chicks. Egyptian Journal of Nutrition and Feeds. 2006; 9:277-297.
2. Ahmadiani A, Javan M, Semnani MA, Barat E, Kamalinejad M. Anti-inflammatory and antipyretic effects of *Trigonella foenum-graecum* leaves extracts in rats. Journal of Ethnopharmacology. 2001; 75:283-286.
3. Al-Habori M, Roman A. Pharmacological properties in Fenugreek-The genus *Trigonella*. 1stEdn. by G. A. Petropoulos (Ed), Taylor and Francis, London and New York. 2002; 10:163-182.
4. Al-Sultan SI. The effect of *Curcuma longa* (Turmeric) on overall performance of broiler chickens. International Journal Poultry Science. 2003; 2:351-353.

5. Azoua HM. Effect of hot Pepper and Fenugreek seeds supplementation on broiler diets. Ph.D. Thesis, Egypt. 2001; 181.
6. Ali MA. Effect of probiotics addition to broiler rations on performance and some blood constituents. Egyptian Poultry Science Journal. 1999; 19:161-177.
7. Basch E, Ulbricht C, Kuo G, Szapary P, Smith M. Therapeutic applications of Fenugreek. Alternative Medicine Reviews. 2003; 8:20-27.
8. Das N, Panda DN, Panda R. Immu-21 (containing *Ocimum tenuiflorum*, *Withania somnifera*, *Tinospora cordifolia* and *Phyllanthusemblica* extracts, among others) in broiler rations to augment the immune response against coccidiosis and other infections and to increase the economic returns. Phytomedica. 2001; 2(1/2):77-83.
9. Dwivedi A. Effect of Feeding Shatavari (*Asparagus racemosus*) and Yeast (*Saccharomyces cerevisiae*) Alone and in Combination on the Performance of Broiler Chicks. M.V.Sc. thesis, RAJUVAS, Bikaner, 2013.
10. Khan FU, Durrani FR, Sultan A, Khan RU, Naz S. Effect of Fenugreek (*Trigonella foenum-graecum*) seed extract on visceral organs of broiler chicks. ARPN Journal of Agricultural and Biological Science, 2009; 4: 58-61.
11. Kotaiah T. Poultry production in India-the current scenario. FnBnews.com, 2016.
12. Maity P, Hansda D, Bandyopadhyay U, Mishra DK. Biological activities of crude extracts and chemical constituents of bael, *Aegle marmelos* (L.) Correa. Indian Journal of Experimental Biology. 2009; 47:849-861.
13. Meena MK. Effect of Feeding *Rosmarinus officinalis* and *Trigonella foenum-graecum* L. alone and in Combination on the Performance of Broiler Chicks. M.V.Sc. thesis submitted, RAJUVAS, Bikaner, 2015.
14. North MO. Commercial chicken production manual. 2nd Edn., AVI publishing company, INC, USA, 1981.
15. Prajapat UK. Effect of Supplementation of *Ocimum sanctum* (Tulsi) and *Trigonella foenum-graecum* L. (Fenugreek) on the Performance of Broiler Chicks. M.V.Sc. thesis submitted, RAJUVAS, Bikaner, 2016.
16. Rekhate DH, Ukey S, Mangle LN, Deshmukh BS. Effect of dietary supplementation of Shatavari (*Asparagus racemosus* wild) on hematobiochemical parameters of broilers. Veterinary World. 2010; 3(6):280-281.
17. Singh A, Sharma T, Kaushik PK, Chaturvedi M. Effect of Bael (*Aegle marmelos*) and Giloy (*Tinospora cordifolia*) alone and in combination on Performance Index of broiler chicks. INDIAN Journal of Research Paripex, 2014; 3(12):4-5.