



## Utilization of Fenugreek (*Trigonella Foenum-Graecum*) as Growth Promoter for Broiler Chickens

N. ALLOUI<sup>1\*</sup>, S. BEN AKSA<sup>1</sup>, M.N ALLOUI<sup>2</sup> and F. IBRIR<sup>3</sup>

<sup>1</sup> Poultry Sciences Service, ESPA Laboratory, University of Batna, Algeria

<sup>2</sup> National Research Institute of Animal Production, Balice, Poland

<sup>3</sup> Animal Production Division, INSVSA, University of Batna, Algeria

\*Corresponding author's email: ridan2002@hotmail.com

### ABSTRACT

The aim of the experiment was to compare the production performance of broiler chickens when fed a conventional standard feed and the same feed supplemented with Fenugreek seeds. One hundred and twenty (120) a-day old male broiler chicks of the strain ISA-15, were divided into 2 equal groups; a control group (A) and an experimental group (B), with six replicates of 10 chicks each per group (6×10) in a completely randomized design. The control group received a classic feed based on maize and soybean meal and the experimental group was fed with the same control feed without antibiotic and coccidiostatic and supplemented with Fenugreek seeds at (3g/kg of feed). Fenugreek seeds supplementation significantly ( $p<0.05$ ) affected Live body weight (LBW), feed intake (FI) and feed conversion ratio (FCR), however, there is no significant difference ( $P>0.05$ ) for the slaughters parameters (dressing percentage, carcass length) and mortality.

**Keywords:** Broiler chickens, Feed additive, Fenugreek and Growth promoter

### INTRODUCTION

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, anthelmintic, antibacterial, anti-inflammatory, antipyretic, and antimicrobial properties (Bash et al, 2003). It contains neurin, biotin, trimethylamine which tends to stimulate the appetite by their action on the nervous system (Al Habori and Roman, 2002).

Fenugreek is a good source of dietary protein for consumption by human and animals, and of fatty acids which are predominantly linoleic, linolenic, oleic and palmitic (Schryver, 2002). Also it contains many carbohydrates, minerals and vitamins (Michael and Kumawat, 2003). Based on the worth mentioning values of Fenugreek, a research study was designed to explore its effects as growth promoter of broiler chicks.

Several investigators reported that using medicinal plants in broiler diets improved body weight gain and feed conversion efficiency and reduced the cost of feed (Azoua, 2001; Abdel-Azeem, 2006; Farman Ullah et al, 2009). Thus, the objective of the present study was to investigate the impact of

Fenugreek seeds as natural feed additives on the performance of broiler chicks

### MATERIALS AND METHODS

The aim of the experiment was to compare the effects of Fenugreek seeds supplemented to broiler chickens diets on the production performance.

One hundred and twenty (120) a-day old male broiler chicks (ISA 15) were purchased from a local hatchery and divided into 2 equal groups; a control group (A) and an experimental group (B), with six replicates of 10 chicks each per group (6×10) in a Completely Randomized Design (CRD). The control group receiving diet 1; a classic feed based on maize and soybean meal (Table 1) and the experimental group was fed diet 2, which is the same control feed without antibiotic and coccidiostatic and supplemented with Fenugreek seeds at (3g/kg of feed).

Diet 1(control group -A) = basal diet with antibiotic (enrofloxacin, 10 mg/kg feed)) and coccidiostatic (salinomycin, 10 mg/kg feed)

Diet 2(experimental group-B) = basal diet with Fenugreek seeds at (3g/kg feed).

During the experimental period, the following performance parameters were monitored: live body weight (LBW) at the 3<sup>rd</sup> and 6<sup>th</sup> week of age, feed

intake (FI) daily, feed conversion ratio (FCR) and mortality rate. At 6 weeks old, 30 broilers from each feeding group were chosen on the basis of the mean body weight, slaughtered and then dissected in order to determine their carcass dressing percentage and carcass length.

Statistical analysis was performed by SPSS 15.0. The differences were tested by the analysis of variance (ANOVA), and were considered significant at  $P < 0.05$ .

## RESULTS AND DISCUSSION

Table 2 shows that broiler chicks fed diet supplemented with Fenugreek seeds at 3g/kg of feed, had the highest values ( $p < 0.05$ ) of live body weight (LBW) at 21 and 42 days of age. The improvement in body weight may be due to the presence of the fatty acids (Murray et al, 1991), or due to stimulating effect on the digestive system of broilers (Hernandez et al, 2004). These findings were in agreement with those of Azoua (2001) who noted that adding Fenugreek to broiler diet resulted in an increased body weight.

Also Table 3 indicates that feeding of Fenugreek seeds supplemented diet significantly ( $p < 0.05$ ) affected feed intake (FI) value during 42 days of age, while there appeared no significant differences ( $P > 0.05$ ) when broiler chicks fed fenugreek seed during the 21 days of age as compared with control group. The improvement in feed intake with the addition of fenugreek seed could be attributed to the carbohydrates and their main component (galactomannan) which stimulated the appetizing and digestive process in animals (Steiner, 2009).

Data presented in Table 3, showed that fenugreek seeds significantly ( $p < 0.05$ ) affected Feed Conversion Ratio during the 42 days of age. This is related to the development of the broiler chicks' gut. Morphological changes of gastrointestinal tissues can be induced by differences in gut load of microbial content including their metabolites (Xu et al, 2003).

Results presented in Table 3 indicated that feeding 3g/kg of fenugreek seeds insignificantly ( $P > 0.05$ ) affected slaughters parameters (dressing percentage and carcass length) and mortality. These results agree with the findings of Abaza (2001), Guo et al. (2004) and Farman Ullah et al. (2009).

## CONCLUSION

The forementioned results confirm the beneficial use of Fenugreek seeds (3g/kg) in broiler chicken diets, as it increases production performances. Fenugreek can be an alternative to antibiotic growth promoters and is highly recommended as feed supplement.

**Table 1:** Composition of the basal diets

Ingredient (%)	Starter (1-21 day)	Finisher (22-42 day)
Maize	51	53
Soybean meal (45% protein)	30	25
Wheat	13.8	15
Oil	1	2.5
Premix*	2.5	2.5
Di- Calcium phosphate	1.2	1.2
Salt	0.3	0.3
DL Methionine	0.1	0.1
L-Lysine	0.1	0.1
<b>Calculated chemical analysis</b>		
ME (Kcal/kg)	3000	3085
Crude protein %	21.2	19.4
Avialable phosphore %	0.73	0.68
Calcium %	0.70	0.53
Methionine %	0.34	0.30
Lysine %	1.19	1.08

\* Provided per kg of diet: vitamin A, 8,800 IU; vitamin D3, 3,300 IU; vitamin E, 40 IU; vitamin K3, 3.3 mg; thiamine, 4.0 mg; riboflavin, 8.0 mg; pantothenic acid, 15 mg; niacin, 50 mg; pyridoxine, 3.3 mg; choline, 600 mg; folic acid, 1 mg; biotin, 220 mg; vitamin B12, 12 mg; antioxidant, 120 mg; manganese, 70 mg; zinc, 70 mg; iron, 60 mg; copper, 10 mg; iodine, 1.0 mg; selenium, 0.3 mg

**Table 2:** Feed intake, live body weight and feed conversion ratio at 21 and 42 days of age (mean±se)

Age Groups	day 21			day 42		
	FI (g)	LBW (g)	FCR (g/g)	FI(g)	LBW(g)	FCR(g/g)
Control (A)	568 <sup>b</sup> ± 14.34	357 <sup>b</sup> ± 16.21	1.78 <sup>b</sup> ± 0.08	3210 <sup>a</sup> ± 10.32	1575 <sup>c</sup> ± 35.32	2.23 <sup>c</sup> ± 0.043
Fenugreek (B)	603 <sup>b</sup> ± 21.32	389 <sup>a</sup> ± 13.56	1.80 <sup>b</sup> ± 0.03	3365 <sup>b</sup> ± 3.32	1712 <sup>a</sup> ± 26.47	1.85 <sup>a</sup> ± 0.052

FI (Feed Intake), LBW (Live Body Weight), FCR (Feed Conversion Ratio): means in the sam colum with no common superscript are significantly different ( $p \leq 0.05$ )

**Table 3:** Carcass characteristics at 42 days of age and mortality rate of broiler chickens

Characteristic	Control (A)	Fenugreek (B)	Significance*
Dressing percentage	68.52 ± 0.94	69.32 ± 0.65	NS
Carcass length (cm)	27.03 ± 0.56	27.33 ± 0.33	NS
Mortality (%)	2	0	NS

NS\*: not significant

## REFERENCES

Abaza IM (2001). The use of some medicinal plants as feed additive in broiler diets. Ph D Thesis, Faculty of Agriculture, Alexandria University, Egypt

Abdel-Azem F (2006). Effect of using fenugreek and fennel seeds as natural feed additives on

performance of broiler chicks. Egyptian Journal of Nutrition and Feeds, 9: 277-297

Al-Habori M and Roman A (2002). Pharmacological properties in fenugreek-The genus *Trigonella*. 1<sup>st</sup> Edn. by G.A. Petropoulos (Ed), Taylor and Francis, London and New York, 10, 163-182

Azoua HM (2001). Effect of hot pepper and fenugreek seeds supplementation on broiler diets. Ph D

- Thesis, Faculty of Agriculture, Alexandria University, Egypt
- Bash E, Ulbricht C, Kuo, G, Szapary P et Smith M (2003). Therapeutic applications of fenugreek. *Alternative Medicine Review*, 8: 20-27
- Faman Ullah, K, Durrani FR, Asad S, Rifat Ullah K and Shabana N (2009). Effects of Fenugreek (*Trigonella foenum-graecum*) seed extract on visceral organs of broiler chicks. *ARNP Journal of Agricultural and Biological Science*, 4, 1: 58-60
- Guo FC, Kwakel CRP, Soede J, Williams BA et Verstegen MW (2004). Effect of a Chinese herb medicine formulation, as an alternative for antibiotics, on performance of broilers. *British Poultry Science*, 45: 793-797
- Hernandez AI, Madrid J, Garcia V, Orengo J et Meglas MD (2004). Influence of two plant extracts on broiler performances, digestibility and digestive organs size. *Poultry Science*, 83: 169-174
- Michael D and Kumawat D (2003). Legend and archeology of fenugreek, constitutions and modern applications of fenugreek seeds. *International Symposium, USA*, pp 41-42
- Murray RK, Granner DK, Mayes PA et Rodwell VW (1991). *The Text Book of Harpers Biochemistry*. 22 Edn. Appleton and large. Norwalk, Connecticut/Loss Altos, California.
- Schryver T (2002). Fenugreek. *Total Health*, 24: 42-44.
- Steiner T (2009). *Phytogenics in Animal Nutrition. Natural Concepts to Optimize Gut Health and Performance*. Nottingham University Press.