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Feeding effect of different level of fenugreek powder and vitamin E on carcass quality of broilers

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Abstract

Present investigation was appraised to study the effect of feeding fenugreek seed powder and vitamin E on feed consumption, live body weight, body weight gain, feed conversion efficiency, dressing percent, giblet weight and intestinal viscera analyzing experimental data collected from 120 birds of Cobb-400 strain carried out at Poultry Research and Training Centre, Sardar Vallabhbhai Patel University of Agriculture & Technology, Modipuram, Meerut. Birds utilized were selected randomly and divided into four equal groups, each were fed varying diets. For treatments T₁, T₂, T₃ and T₄ dressing percent was computed as 68.02±0.78, 68.56±0.57, 68.19±0.51 and 68.78±0.55 while giblets (heart, liver and gizzard) has weighed with quantum of 3.33±0.11, 3.55±0.03, 3.45±0.12 and 4.34±0.13 percent, respectively. Similarly, intestinal viscera (%) for all groups were found to be 3.21±0.08, 3.55±0.18, 3.82±0.03 and 4.10±0.05, respectively. Carcass traits considered for the present study were found to have significant difference among them. According to present trial, combined inclusion of fenugreek seed powder and vitamin E as 2.0g and 50mg per kg of feed has adjudged to be better proposition to improve the overall performance.

Keywords: Broiler chicks, carcass, fenugreek powder, vitamin E

Introduction

The world poultry industry has grown consistently since 1940s and the broiler industry has now occupied second place by volume in the world just after pork. Chicken meat represents 29 percent of total meat production from farm animals. Poultry farming in India has transformed itself from backyard venture in to a dynamic agro-industry in few decades and currently possess third and fourth place in egg and broiler production, respectively. Growth promoters are chemical and biological substances added to poultry feed with the aim of improving growth, feed utilization, disease resistance and vitality, regulation of the intestinal micro-flora, reduced morbidity and mortality and in this way realize better production and financial returns. Various types of feed additives such as antibiotics, enzymes, hormones, prebiotics, probiotics, herbal products etc. are used as growth stimulants in poultry production. Fenugreek is an annual legume cultivated across the world, is one of the herbs having multi-functional properties. Husk (seed coat) contains higher amount of polyphenols (103.8 mg of Gallic acid equivalent) and total dietary fiber (77.1%). Seeds are utilized as appetizer and help in digestion; improve growth performance and health status (Abou El-wafa *et al.*, 2003) [1]. Vitamin E is primarily known as an antioxidant in reducing cellular free radical damage but it may also influence the development and maintenance of defense mechanism through multiple functions (Gershwin *et al.*, 1985) [2]. Vitamin E consists of two families of compounds, the tocopherols and tocotrienols, characterised by a 6-chromanol ring and an isoprenoid side chain. The members of each family are designated alpha (α), beta (β), gamma (γ), and delta (δ) according to the position of methyl groups attached to the chroman nucleus. Therefore, 8 stereoisomers of the large vitamin E family are possible but only the RRR-form occurs naturally. Tocopherols and tocotrienols are differentiated by their phenyl "tails" as these are saturated in the tocopherols but unsaturated in the tocotrienols.

To get better production and financial returns from a broiler farm, growth promoters are generally added to poultry feed aiming to improve the growth, feed utilization, stimulation of immune system and increased vitality, regulation of intestinal micro-flora, reduced morbidity and mortality by optimizing hepatic functions of the birds. Therefore, present investigation was designed with the intension of getting maximum yield of edible part of broiler's body per unit of feed offered, which in turn can contribute substantially to raise the overall availability of chicken meat per capita.

Materials and Methods

Data collected on 120 randomly selected unsexed 4-way cross broiler chicks of Cobb-400 strain for growth, feed conversion efficiency and carcass parameters from experimental broiler flock maintained at Poultry Research and Training Centre, SVPUA&T, Meerut were analyzed for the present investigation. Fenugreek seed powder, Vitamin E and day old broiler chicks were procured from localized market in Meerut district. Four diets with different levels of fenugreek seed powder and vitamin E provided to four groups of birds having three replicates in each group and 10 birds in each replicates. Identical conditions for housing, brooding, feeding and watering on the scientific line were made available to every treatment throughout the entire span of experiment.

Dietary plan of the trial envisaged T₁- Basal ration (control), T₂- Basal ration + Fenugreek seed powder @ 2g/kg of feed, T₃- Basal ration + vitamin E @ 50 mg/kg of feed and T₄- Basal ration + Fenugreek seed powder 2g/kg + vitamin E 50mg/kg of feed.

Measurement of parameters

Carcass parameters

Three broiler birds were selected randomly from each treatment and weighed for live weight after allowing them fast for overnight. Halal method of slaughter was practiced. Following carcass traits were measure.

Dressed weight = Live weight – blood, feathers, head, shank and skin losses.

$$\text{Dressing (\%)} = \frac{\text{Dressed weight (deskinned)}}{\text{Live weight}} \times 100$$

$$\text{Giblet weight} = \frac{\text{Weight of organ in grams}}{\text{Live body weight in grams}} \times 100$$

$$\text{Intestine viscera} = \frac{\text{Weight of organ in grams}}{\text{Live body weight in grams}} \times 100$$

Data were analyzed by using Completely Randomized Design (CRD) under uniform and standard management practices following one way ANOVA procedure of SPSS version 20 (SPSS for windows, V 20.0; SPSS Inc., Chicago, IL, USA). The linear model adopted was:

$$Y_{ijk} = \mu + T_j + W_k (T \times W)_{ij} + e_{ijk}$$

Where, Y_{ijk} = Dependent Variable; μ = Overall Mean; T_j = Mean effect of Treatments (j = 1 ...8); W_k = Mean effect of Week (k = 1 ...6) and e_{ij} = Unexplained residual element assumed to be independent and normally distributed. Testing of significance was done as per Duncan Multi Range Test (DMRT).

Table 1: Composition of fresh fenugreek seeds (Values expressed per 100g.)

Component	Fenugreek seeds
Moisture	-
Protein	30g
Fat	7.5g
Fiber	50g
Sapogenins	2g
Trigonelline	380 mg
Ca	160 mg
Mg	160 mg
P	370 mg
Fe	14 mg
Na	19 mg
K	530 mg
Cu	33 mg
S	16 mg
Cl	165 mg
Mn	1.5 g
Zn	7.0 mg
Cr	0.1 mg
Choline	50 mg
Vitamin C	43 mg
β -Carotene	96 μ g
Thiamine	340 μ g
Riboflavin	290 μ g
Nicotinic acid	1.1 mg
Folic acid	84 μ g

Results and Discussion

Carcass parameters of experimental birds

Mean value of dressing percentage for the groups has been presented in Table 2. The mean values of dressing percentage were 68.02 ± 0.78 , 68.56 ± 57 , 68.19 ± 0.51 and 68.78 ± 0.55 percentage in group T₁, T₂, T₃, and T₄, respectively. The dressing percentage of the all groups was found to be non-significant (P<0.05). However, dressing percent of broiler chicks differ significantly among the treatment and did not differ in their interaction during study period. Comparable results were shown by Farman Ullah Khan, *et al.* (2009), Rabia J. Abbas (2010) [16] Omar J. Abo, *et al.* (2016) [17], K.Y. Yesuf, *et al.* (2016), Yonatan Kassu *et al.* (2016) [19].

Similarly, giblet percentage of broiler chicks significantly differs between the treatments and did not differ in their interaction. Estimated values of giblet weight were observed to be 3.33 ± 0.11 , 3.55 ± 0.03 , 3.45 ± 0.12 and 4.34 ± 0.13 percent for group T₁, T₂, T₃, and T₄ respectively. Non-significant difference was observed for giblet weight for all the treatment groups except T₄.

Table 2: Effect of feeding fenugreek seed powder and vitamin E on dressing percent, giblet weight and intestinal viscera under various treatments

Parameter	Treatments				Overall Mean	Pooled SEM	CD
	T ₁	T ₂	T ₃	T ₄			
Dressing percent	68.02 ^a	68.56 ^a	68.19 ^a	68.78 ^a	68.38	0.60	NS
Giblet weight (%)	3.33 ^a	3.55 ^a	3.45 ^a	4.34 ^b	3.62	0.10	0.36
Intestinal viscera (%)	3.21 ^a	3.55 ^b	3.82 ^{bc}	4.10 ^c	3.67	0.09	0.35

Averages for intestinal viscera for all four groups have also been presented in Table 2 and were computed as 3.21±0.08, 3.55±0.18, 3.82±0.03 and 4.10±0.05 percent in group T₁, T₂, T₃, and T₄, respectively. The study revealed that intestinal viscera percentage was higher in T₄ with magnitude of 4.10 ± 0.05 which was differ significantly with T₁ and T₂, respectively while T₃ was show the non-significant difference with T₂ and T₄ group. The average of feed consumption during different weeks from 1th to 6th weeks was found to be almost analogous for all groups. Body weight and feed efficiency was observed significantly higher in treatments groups either fed with fenugreek seed powder (FSP) and vitamin E combination of both in comparison to control group. Similarly, the feed conversion efficiency was also significantly higher in treatment groups. The usefulness of *Trigonella foenum-graecum* and *Tocopherol* as growth promoter and appetizer has improved feed conversion efficiency and increased live body weight which may be attributed to its high content of vitamin E and antioxidant present in fenugreek seed and vitamin E antimicrobial, immunomodulatory anti-stress, antipyretic, antiasthmatic and analgesic activities present in FSP. The dressing percentage was observed better in Methi and vitamin E supplemented groups. Also the giblet and intestinal viscera percentage percent in treatments groups with Methi and vitamin E supplementation was more when compared with the non-supplemented groups. Present observation may be compared with the findings of Ihsan T. Tayeb *et al.* (2012) ^[20], Jafari *et al.* (2012) ^[21], Gamel Ai, *et al.*, (2013) ^[22], R.M.Patel, *et al.* (2017) ^[23] for carcass parameters.

Conclusion

In general, it was concluded that supplementation of Methi+Vitamin E at an inclusion rate of 2(g.)/Kg+50(mg.)/kg. diet was found optimum and had significant effect on Dressing percent, Giblet weight, Intestinal viscera efficiency. It also improves the carcass parameters of birds, which ultimately yields more economic profits for the poultry farmers.

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