

SHORT COMMUNICATION

Effect of Dietary Supplementation of Fenugreek Seed (*Trigonella foenum*) on Body Condition Score, Udder Health and Faecal Egg per Gram of Dairy Cows

Neha Rathore¹, Mukesh K. Mehta², Ravindra K. Jain³, Ashok K. Patil^{4*}

ABSTRACT

The study was carried out to observe the effect of dietary supplementation of Fenugreek seed on body condition score (BCS), udder health, and faecal egg per gram (EPG) of dairy cows. Twelve multiparous lactating cows at an early stage of lactation were selected and randomly allotted into two groups (n=6) of six cows each. The animals in group-T₀ were fed normal feed without fenugreek seeds and served as control. The animals in group-T₁ were given ground fenugreek seeds (*Trigonella foenum*) @ 100 g/d/head for 90 days, in addition to the usual feed/fodder. The udder health, body condition score, and faecal egg count of gastro-intestinal helminths were recorded fortnightly for 90 days. The mean numerical value of BCS was higher (3.78 ± 0.06 vs. 3.60 ± 0.07), whereas milk pH (6.63 ± 0.02 vs. 6.81 ± 0.02), SCC (1.95 ± 0.07 vs. 2.37 ± 0.05 × 10⁵) and EPG (866.67 ± 21.40 vs. 964.29 ± 27.29) were non-significantly lower in treatment group as compared to the control group.

Keywords: Dairy cows, Fenugreek seed, Gastro-intestinal helminths, Milk pH, Somatic cell count, Udder health.

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INTRODUCTION

Bovine mastitis is globally recognized as the most common and costly disease affecting dairy herds. The disease causes huge financial losses to dairy industries by reducing milk yield and quality, deaths and culling of affected animals, and treatment costs (Rathod *et al.*, 2017; Singh and Kumar, 2012). The most common treatment method available against bovine mastitis is the intra-mammary infusion of antibiotics. However, prolonged use of antibiotics for treatment of mastitis developed resistance against antibiotics which led to a search of alternatives for mastitis treatment worldwide. In the last few decades, extensive research has been focused on characterizing the antibacterial effects of different herbs and aromatic plants, and many other natural substances. The seeds of fenugreek are aromatic, bitter, and known to have carminative, hypocholesterolemic, gastro- and hepato-protective, anti-parasitic, galactagogue, antibacterial, and antioxidant properties. In India much work has been done on the prevention of mastitis by using a combination of herbs. However, the use of fenugreek in dairy cows is not well documented in the literature. Therefore, the present study was designed to evaluate the effect of fenugreek seed supplementation on body condition score, udder health, and faecal egg per gram (EPG) of dairy cows.

MATERIALS AND METHODS

Twelve multiparous lactating cows at an early stage of lactation were selected at Ahilyamata Gaushala, Indore (MP) and housed in a separate shed with open and close space.

¹⁻⁴Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, Mhow, Nanaji Deshmukh Veterinary Science University, Jabalpur (MP), India

Corresponding Author: Ashok Kumar Patil, Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, Mhow, Nanaji Deshmukh Veterinary Science University, Jabalpur (MP), India, e-mail: ashokdrpatil@gmail.com

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Proper health management and sanitary conditions were maintained throughout the experimental period. Animals were randomly divided into 2 groups of 6 each (Control T₀ and Treatment T₁). The cows in group T₀ were fed standard normal feed without fenugreek seed, while the cows in group T₁ were provided ground fenugreek seeds (*Trigonella foenum*) @ 100 g/d/head for 90 days, in addition to normal routine feed and fodder. All the animals were fed standard seasonally available roughages and concentrates mixture to meet the nutrient requirement as per ICAR (2013). The milking was performed twice daily at 5 AM, and 4 PM. Milk samples were collected fortnightly interval after complete milking and thorough mixing from each animal both morning and evening in 100

ml sterile plastic bottles. pH of pooled milk was determined within few minutes after milking with the help of a portable digital pH meter [Model pHep (HI 70300)]. The somatic cell was counted by using the standard method of Dang and Anand (2007). The body condition score (BCS) of each cow was evaluated and scored according to Ferguson *et al.* (1994). About 10-15 g fecal samples were obtained directly from the rectum, placed in a separate plastic bag containing formalin and immediately transferred to the laboratory for parasitic egg counts following the McMaster method of Soulsby (1982).

Data pertaining to udder health, BCS, and egg per gram feces were subjected to independent 't' test using the statistical package SPSS 20.0.

RESULTS AND DISCUSSION

Effect on pH and Somatic Cell Count of Milk

The results on the effect of fenugreek seed supplementation in a feed of cows are presented in Table 1. A perusal of the data Table 1 reveals that the addition of fenugreek seeds in the feed has no adverse effect on any of the parameters studied. The most important parameter pH and somatic cell count, which are related to mastitis, were found in the normal range, *i.e.*, pH was found in the range of 6.73 ± 0.09 to 6.91 ± 0.06 and 6.46 ± 0.07 to 6.82 ± 0.03 in control and treatment group, respectively. The mean value of pH was numerically decreased in fenugreek supplemented group as compared to untreated control group (6.81 ± 0.02 and 6.63 ± 0.02). Similar results were also obtained by Kolte *et al.* (2008) in cows. In mastitis increased permeability of the mammary gland to blood components, *viz.*, bicarbonate ions result in higher pH values in the milk.

In the present study, mean values of somatic cell count (10^5) were 2.37 ± 0.05 and 1.95 ± 0.07 in T_0 and T_1 group, respectively, and it did not differ significantly ($p > 0.05$) between the groups. Values of SCC observed in the present study were within the normal physiological range (SCC, 1.91 - 2.43×10^5) in dairy cattle. However, numerically the values were approaching towards lower in T_1 group throughout the study period (Table 1). In corroboration to the present study, Kumari (2015) also reported lower ($p \geq 0.05$) SCC in the polyherbal supplemented groups of Karan Fries cows than the control. A somatic cell has a close relationship with inflammation, udder health and milk quality, and it reflects the herd health status (Sumathi *et al.*, 2015). In the present study, fenugreek seed supplementation reduced the udder inflammation and SCC count.

Effect on Body Condition Score (BCS) of Cows

The overall mean body condition scores (BCS) observed in the present study were comparable and statistically similar in both the groups; however, the values were numerically higher at all intervals, which indicated that the supplementation of fenugreek has a positive effect on BCS of dairy cows.

Table 1: Effect of dietary inclusion of fenugreek seeds on fortnightly udder health, body condition score, and fecal egg count of dairy cows (Mean \pm SE)

Fortnights	T_0 (Control, n = 6)	T_1 (Treatment, n = 6)	Significance
<i>Milk pH</i>			
Initial	6.90 ± 0.05	6.82 ± 0.03	NS
1 st	6.79 ± 0.06	6.48 ± 0.04	NS
2 nd	6.85 ± 0.06	6.73 ± 0.06	NS
3 rd	6.79 ± 0.07	6.63 ± 0.04	NS
4 th	6.69 ± 0.06	6.61 ± 0.08	NS
5 th	6.91 ± 0.06	6.72 ± 0.05	NS
6 th	6.73 ± 0.09	6.46 ± 0.07	NS
Overall	6.81 ± 0.02	6.63 ± 0.02	NS
<i>Somatic Cell Count (SCC) $\times 10^5$</i>			
Initial	2.43 ± 0.14	2.40 ± 0.15	NS
1 st	2.37 ± 0.11	2.11 ± 0.12	NS
2 nd	2.35 ± 0.08	1.82 ± 0.10	NS
3 rd	2.28 ± 0.07	1.78 ± 0.10	NS
4 th	2.43 ± 0.03	1.65 ± 0.07	NS
5 th	2.35 ± 0.05	1.86 ± 0.06	NS
6 th	2.42 ± 0.03	1.99 ± 0.04	NS
Overall	2.37 ± 0.05	1.95 ± 0.07	NS
<i>Body condition score</i>			
Initial	3.55 ± 0.09	3.62 ± 0.08	NS
1 st	3.48 ± 0.08	3.72 ± 0.07	NS
2 nd	3.60 ± 0.06	3.87 ± 0.03	NS
3 rd	3.72 ± 0.06	3.75 ± 0.05	NS
4 th	3.58 ± 0.09	3.93 ± 0.08	NS
5 th	3.67 ± 0.09	3.83 ± 0.09	NS
6 th	3.63 ± 0.09	3.74 ± 0.07	NS
Overall	3.60 ± 0.07	3.78 ± 0.06	NS
<i>Faecal Eggs per gram</i>			
Initial	750.00 ± 42.82	650.00 ± 42.82	NS
1 st	883.33 ± 30.73	700.00 ± 36.51	NS
2 nd	916.67 ± 54.26	783.33 ± 40.14	NS
3 rd	933.33 ± 49.44	900.00 ± 36.51	NS
4 th	1016.67 ± 79.23	950.00 ± 76.38	NS
5 th	1083.33 ± 60.09	1033.33 ± 49.44	NS
6 th	1166.67 ± 49.44	1050.00 ± 56.27	NS
Overall	964.29 ± 27.29	866.67 ± 21.40	NS

n = No. of observations or animals, NS = Non-significant between groups ($p > 0.05$)

Effect on Faecal Egg per Gram (EPG)

In the present study, the overall mean EPG was 964.29 ± 27.29 and 866.67 ± 21.40 in T_0 and T_1 groups, respectively, which did not differ significantly. However, the values were approaching the lower side in the T_1 (Treatment) group as compared to control group at all intervals of study (Table 1).

Terrill *et al.* (2009) reported a reduction in EPG by 84.6 and 91.9% with the addition of *Lespedeza cuneata* hay in goat feed. The reduction in egg per gram in our study might be due to the presence of some components like alkaloids, flavonoids, saponin, tannins, and steroidal glycosides in the fenugreek seeds.

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