

Effect of Dietary Supplementation of Fenugreek Seed (*Trigonella foenum graecum*), Giloy (*Tinospora cordifolia*) and Shatavari (*Asparagus racemosus*) on Haematological Parameters of Lactating Sahiwal Cattle

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ABSTRACT: To observe the effect of various conventional herbs such as Fenugreek (*Trigonella foenum graecum*), Giloy (*Tinospora cordifolia*) and Shatavari (*Asparagus racemosus*) in livestock feeding, the present research work was conducted on twenty four Sahiwal cattle of lactation age group. The duration of experimental period was 120 days. Sahiwal cattle were randomly distributed into four dietary treatment groups composed with six animals in each group. The different dietary programme used in the study were as follows: T₀ (Control group); Basal diet only, T₁; Basal diet+100 g Fenugreek seed powder, T₂; Basal diet+100 g Giloy stem powder and T₃; Basal diet+100 g Shatavari root powder along with the concentrate feed. For evaluation of haematological parameters blood samples were collected from each cattle. Parameters viz., haemoglobin, packed cell volume, total erythrocyte count, total leukocyte count and differential leukocyte were measured by using standard procedures in laboratory. The statistical analysis of the data revealed non-significant effect of dietary supplementation of various herbal feed additives on haematological parameters of lactating Sahiwal cattle except the packed cell volume which differed significantly ($p>0.05$) that suggested no harmful effect on general health condition of experimental cattle.

Keywords: Fenugreek seed, Herbal, Haematological parameters, Blood, Sahiwal.

INTRODUCTION

Indian economy is primarily based on agriculture for employment and livelihood of rural population of India. Almost 70 percent population of India lives in villages, where livestock plays an important role in maintaining the socio-economic status of life. India is a leading milk producer country around the world with 24% global milk production in year 2022-23 and holds first rank throughout the world. The annual milk production was recorded 230.58 million tonnes in year 2022-23 at annual growth rate of 3.84% as compared to previous year with per capita availability of 459 g per day. Herbal feed additives improve the productivity and reproductive efficiency of dairy animals by promoting the growth of beneficial microorganisms in the rumen, stimulating the secretion of various digestive enzymes, which enhances the nutrient utilization or stimulating the milk-secreting tissues in the mammary glands. The incorporation of diverse traditional herbs into animal feed formulations has the potential to augment animal performance metrics, encompassing growth and milk production. Notably, within the Indian market, herbs are gaining increasing traction due to their ready availability, non-toxic nature, and cost-effectiveness relative to contemporary pharmaceuticals. Several herbs

have found utility as organic feed additives, effectively elevating both animal productivity and well-being. Herbs exhibit a range of properties encompassing enhanced digestibility, antimicrobial, immunomodulating, coccidiostatic, antioxidative, anthelmintic, and antiviral attributes. Various herbs can be used as natural feed additives to increase the productivity of animals and promote animal health.

Use of herbal galactogogues plays a significant role in safe milk production because it has no side effects and they do not leave any residues in milk. The use of herbal galactogogues in animal feeding contributes to the promotion of safe milk production without imposing any detrimental side effects on the animals' well-being. Fenugreek seeds encompass a diverse array of compounds, comprising alkaloids, flavonoids, amino acids, saponins, tannins, as well as vitamins A, B1, B2, and C, along with nicotinic acid, niacin, and specific steroidal glycosides, with certain members of this chemical ensemble demonstrating antioxidant characteristics (Ahmad *et al.*, 2016). Giloy has various phytochemical constituents such as alkaloids, glycosides, proteins, steroids, polysaccharides, aliphatic compounds, essential oil, phosphorous, sesquiterpenoid, tannin, saponin, terpenoids, and amino acid. While every part of this plant possesses therapeutic

significance, the stem is the most commonly utilized in medicinal preparations. Giloy contains a complex chemical composition, comprising more than 100 constituents, making it a prominent component in Veterinary folk medicine, Ayurveda, and other medical systems. Its versatile properties encompass being a general tonic, antioxidant, antibacterial, antidiabetic, anticancer, anti-allergic, immunomodulatory, hepatoprotective, and anti-inflammatory agent (Krishna *et al.*, 2005). In traditional usage, shatavari serves as a holistic health tonic and revitalizing agent, renowned for its capacity to enhance vitality, promote lactation, and bolster reproductive health. This botanical exhibits antispasmodic properties and has been employed in the treatment of a diverse range of ailments, encompassing cough, edema, rheumatism, indigestion, chronic fevers, diarrhea, and dysentery. Furthermore, it holds aphrodisiac qualities.

MATERIALS AND METHODS

The present investigation was performed at Instructional Dairy Farm (IDF), Nagla, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. A total of twenty-four Sahiwal cattle in lactation were selected, and they were divided into four treatment groups at random, with six animals in each group. The average milk output, uniform parity, and identical lactation stage were used to establish each group. Adaptation period of one week was provided to all experimental animals before beginning of experiment. Control group T₀ were kept with only basal diet. Treatment groups T₁, T₂, and T₃ were supplemented with Fenugreek seed powder (*Trigonella foenum-graecum*), Giloy (*Tinospora cordifolia*) stem powder and Shatavari (*Asparagus racemosus*) root powder along with concentrate feed @100 g/animal/day, respectively for period of 120 days. After collection of blood it was transferred to EDTA coated vials for complete blood count. PCV was measured using

macro-haematocrit method and Hb was estimated using Sahli-Hellige haemoglobinometer. Total erythrocyte count (TEC) and total leukocytes count (TLC) was carried out using haemocytometer as per standard method used by Benjamin (1978). Differential leucocyte count (DLC) was carried out as per the standard method described by Jain (1986) using the Gimsa stain.

Statistical analysis. The experimental data obtained in the present study was recorded and analyzed statistically by using One way analysis of variance (ANOVA) by using SPSS software (Snedecor and Cochran 1994).

RESULT AND DISCUSSION

Mean values of Hb, PCV, total erythrocytes count (TEC), total leukocyte count (TLC) and differential leukocyte count (DLC) of experimental animals have been presented in Table 1. The study reported non-significant effect of dietary supplementation of Fenugreek seed, Giloy stem and Shatavari root powder on all the haematological parameters of Sahiwal cattle except packed cell volume. The mean PCV values were significantly ($p < 0.05$) improved in T₁ treatment groups as compared to T₂ treatment group. However, the values were statistically similar to the control group T₀ and T₃. On the other hand T₂ group showed statistical resemblance with control group T₀. The hematological parameters of Sahiwal cattle in all the treatment groups were found within the normal range which indicates no harmful effect on general health condition.

In addition, Hendawy *et al.* (2019) suggested non-significant effect of dietary supplementation some medicinal plants on haemoglobin content of lactating ewes. Contrary to the present findings Mallick *et al.* (2011); El-Tarabany *et al.* (2018) reported significant changes in haematological parameters of dairy goats as a result of dietary supplementation of Fenugreek seeds at the level of 50g and 100 g.

Table 1: Effect of dietary supplementation of Fenugreek, Giloy and Shatavari on hematological parameters (Mean±SE) of Sahiwal Cattle.

Attributes	T ₀	T ₁	T ₂	T ₃
Haemoglobin (g/dl)	12.05±0.08	12.02±0.11	12.00±0.11	11.85±0.09
PCV (%)	32.60 ^{ab} ±0.16	33.02 ^b ±0.19	32.22 ^a ±0.14	32.64 ^{ab} ±0.12
TEC (10 ⁶ /cumm)	7.25±0.06	7.20±0.04	7.24±0.08	7.27±0.04
TLC (10 ³ /cumm)	8.57±0.03	8.60±0.03	8.53±0.02	8.55±0.03
Lymphocytes (%)	64.48±0.04	64.44±0.06	64.37±0.05	64.30±0.06
Monocytes (%)	3.96±0.08	4.10±0.09	4.18±0.05	4.12±0.05
Neutrophils (%)	24.69±0.10	24.60±0.07	24.69±0.13	24.62±0.07
Eosinophiles (%)	2.57±0.03	2.61±0.05	2.69±0.06	2.72±0.07
Basophils (%)	0.05±0.01	0.10±0.04	0.07±0.02	0.06±0.02

Means bearing different superscript in a row differ significantly ($p < 0.05$)

CONCLUSIONS

The present study concluded that the inclusion of different herbs viz. Fenugreek seed powder (*Trigonella foenum graecum*), Giloy stem powder (*Tinospora cardifolia*) and Shatavari root powder (*Asparagus racemosus*) in the feed of lactating cattle @ 100 g/day did not affected the haematological parameters thus it

be can be safely incorporated in the basal diet of Sahiwal cattle.

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Conflict of Interest. None.

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