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**Jyoti Srivastav**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Sanjay Kumar**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**RK Sharma**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Jyoti Palod**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Shive Kumar**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**AK Ghosh**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Tushar Saxena**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Jagriti Srivastav**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Anupam Kumar**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

**Corresponding Author:**  
**Jyoti Srivastav**  
Department of Livestock Production  
Management, College of Veterinary and  
Animal Sciences, G.B. Pant University of  
Agriculture and Technology, Pantnagar,  
U.S. Nagar, Uttarakhand, India

## Effect of dietary supplementation of *Trigonella foenum graecum*, *Tinospora cordifolia* and *Asparagus racemosus* on serum mineral profile of lactating Sahiwal cattle

**Jyoti Srivastav, Sanjay Kumar, RK Sharma, Jyoti Palod, Shive Kumar, AK Ghosh, Tushar Saxena, Jagriti Srivastav and Anupam Kumar**

### Abstract

To evaluate the potential benefits of traditional herbs like Fenugreek (*Trigonella foenum graecum*), Giloy (*Tinospora cordifolia*) and Shatavari (*Asparagus racemosus*) in livestock feeding, the present study was performed on 24 lactating Sahiwal cattle from March 2022 to July 2022 in the summer season. The experimental cattle were randomly distributed into four dietary treatment groups composed with six animals in each group. The different dietary regimens used in the study were as follows: T<sub>0</sub> (Control group); Basal diet, T<sub>1</sub>; Basal diet+100 g Fenugreek seed powder, T<sub>2</sub>; Basal diet+100 g Giloy stem powder and T<sub>3</sub>; Basal diet+100 g Shatavari root powder in the concentrate feed. Blood samples from each animal were collected aseptically and serum separation was performed to evaluate serum major minerals viz. Ca and P along with micro mineral elements Zn, Cu and Mg with the help of standard procedures. The statistical analysis of the data suggested non-significant effect of dietary supplementation of Fenugreek (*Trigonella foenum graecum*), Giloy (*Tinospora cordifolia*) and Shatavari (*Asparagus racemosus*) on serum mineral profile of lactating Sahiwal cattle.

**Keywords:** Fenugreek seed, herbal, mineral, blood, sahiwal

### Introduction

India has a predominantly agriculture-based economy and about 70 percent of its population lives in villages, where livestock plays a crucial role in socio-economic life. The total livestock population of India is 535.82 million in 2019, in which the cattle population of India is 192.49 million, increased by 0.8% over the previous census and contributed 36% of the overall livestock production (GOI, 20th Livestock census, 2019). Natural herbal supplements are added to animal feed to boost production efficiency, save the environment, and satisfy consumer expectations for safe food. (Bombik *et al.* 2012) [2]. India is also known as medicinal garden of the world due to presence of richness of therapeutic herbs in nature. Giloy is also known as a Rasayana plant in Ayurveda. It helps to form energy and general vigour also increases the resistance of the body to physical, chemical, and biological stress (Salve *et al.* 2015) [8]. Giloy contains antioxidant, antibacterial, antidiabetic, anticancer, anti-allergic, immunomodulator, hepatoprotective and anti-inflammatory properties (Krishna *et al.* 2005) [7]. Fenugreek is famous worldwide for its immense therapeutic properties such as in lowering plasma cholesterol and triglyceride levels, stimulating digestion, treatment of liver disorders, antidiabetic, carminative and antioxidant properties. Shatavari has therapeutic importance due to the presence of steroidal saponins, sapogenins and phytochemicals. Shatavari has immense galactogauge property also improves mammillary health in both lactating women and cattle. Calcium and phosphorus minerals are responsible for various vital physiological functions in the body. Likewise, several micro-minerals serve as cofactors/metalloenzyme in carbohydrate, protein and nucleic acid metabolism. Therefore, present investigation was planned to study the effect of Giloy (*Tinospora cordifolia*), Fenugreek (*Trigonella foenum graecum*) and Shatavari (*Asparagus racemosus*) on serum mineral profile of lactating Sahiwal cattle.

### Materials and Methods

The present investigation was carried out at Instructional Dairy Farm (IDF), Nagla, College of Veterinary and Animal Sciences, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. 24 lactating Sahiwal cattle were selected and randomly divided into four groups having six animals in each treatment group.

Each of the group was formed on the basis of their average milk yield, uniform parity and same lactation stage. All the experimental animals will be kept for one week of adaptation period before the experiment started. Group T<sub>0</sub> was considered as the control group without any dietary herbal supplementation. Treatment groups T<sub>1</sub>, T<sub>2</sub>, and T<sub>3</sub> 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 from March 2022 to July 2022.

### Collection and storage of blood

Blood samples from each animals were collected in clean screw capped heparinised centrifuge tubes by aseptic venipuncture technique through jugular vein using disposable syringe with 18 –gauge needle. Blood samples were collected and analyzed at monthly interval from start to the end of experimental period. Serum was separated by using centrifuge machine at 25,000 rpm for 20-25 minutes. The concentration of Calcium (Ca) and Phosphorus (P) in serum of experimental animals was estimated by Thermoscientific Evolution 220 UV-Visible spectrophotometer using commercially available kits supplied by ERBA as per the method described by the manufacturer. Serum Zn, Cu and Mg were estimated by Inductively Coupled Plasma –Optical Emission Spectrophotometer (ICP-OES: Agilent 5800) using standard procedure.

### Statistical analysis

Statistical analysis of data obtained during the experiment was

carried out by appropriate method of analysis described by Snedecor and Cochran (2004) for one way Analysis of Variance using SPSS software. The variance ratio (F-values) was recorded significant at five percent probability. Duncan's New Multiple Range Test (Duncan's Range Test) as modified by Kramer (1957)<sup>[6]</sup>, was used to test the significance of mean differences.

### Results and Discussion

Mean values of major minerals such as calcium (Ca), phosphorus (P), magnesium (Mg) and micro minerals i.e. zinc (Zn) and copper (Cu) present in the serum of different groups of Sahiwal cattle have been presented in Table 1. The results revealed numerically higher levels of mean serum minerals of treatment groups as compared to control group T<sub>0</sub>. However, non-significant ( $p>0.05$ ) difference was observed among the treatment groups. The serum calcium and serum phosphorus levels in the present study were observed to be in a normal range given by Kaneko *et al.*, 2008<sup>[5]</sup>. Similarly, non significant difference was found in the mean values of serum zinc, magnesium and copper in different herbal supplemented groups.

The observations recorded in the present study are in accordance with the previous findings of Sharma *et al.* (2020)<sup>[9]</sup> as they reported non-significant effect of dietary supplementation of fenugreek seed and giloy stem on serum Ca, P, Fe and Zn levels in crossbred cattle. Similar findings were reported by Hussain *et al.* (2003)<sup>[4]</sup> and Pankaj *et al.* (2003)<sup>[10]</sup>. Contrary to this, Saini *et al.* (2018)<sup>[9]</sup> reported significant effect of dietary supplementation of Shatavari root powder on serum minerals of lactating cattle.

**Table 1:** Effect of dietary supplementation of *Trigonella foenum graecum*, *Tinospora cordifolia* and *Asparagus racemosus* on serum mineral profile (Mean±SE) of lactating Sahiwal Cattle

Attributes	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Serum Calcium (mg/dL)	11.05±0.19	11.21±0.18	11.33±0.15	11.36±0.16
Serum Phosphorus(mg/dL)	6.74±0.11	6.87±0.18	6.79±0.18	7.12±0.18
Serum Zinc(µg/ml)	1.03±0.02	1.05±0.02	1.05±0.02	1.03±0.02
Serum Magnesium (mg/dL)	2.50±0.11	2.40±0.12	2.56±0.12	2.71±0.14
Serum Copper(µg/ml)	0.84±0.04	0.94±0.03	0.90±0.03	0.93±0.04

### Conclusion

The present study concluded that the herbal feed additives such as Fenugreek seed powder (*Trigonella foenum graecum*), Giloy stem powder (*Tinospora cordifolia*) and Shatavari root powder (*Asparagus racemosus*) at the level of 100 g/day did not create any significant changes in serum mineral profile of lactating Sahiwal cattle.

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### Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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