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## Impact of feeding of different herbal galactogogues on milk mineral profiling of Sahiwal cattle

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### Abstract

To evaluate the potential benefits of traditional herbs like Giloy (*Tinospora cordifolia*), Fenugreek (*Trigonella foenum graecum*) and Shatavari (*Asparagus racemosus*) in the feeding of livestock, the present investigation was performed on 24 Sahiwal cattle of lactation age group during 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. The duration of the study was 120 days. Milk samples were collected at fortnightly interval to evaluate the major minerals viz. Ca and P along with micro elements Zn, Cu and Mg with the help of standard methods adopted in the laboratory. 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 milk mineral profiling of lactating Sahiwal cattle.

**Keywords:** Fenugreek, giloy, Shatavari, minerals, analysis

### 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. Milk has been a fundamental dietary component since ancient times, playing a pivotal role in nutrition worldwide. Ensuring optimal milk production holds paramount importance for the economic viability of dairy operations. Meeting the escalating demand for milk within India's expanding population hinge on enhancing milk output from Indigenous cattle breeds.

India has 53 registered cattle breeds, among which the Sahiwal cattle stand out as one of the foremost milch cattle breeds within the zebu cattle category. This breed traces its origins to the Montgomery district in Punjab, Pakistan, and is recognized by various regional names such as "Lambi Bar," "Lola," "Montgomery," "Multani," and "Teli.

India is regarded as a gold mine for herbal remedies and also known as the "Medicinal Garden of the World." (Mahima *et al.*, 2012; Dhama *et al.*, 2013) [3, 2]. Although modern advancements in the therapeutic field have led to a decrease in the use of traditional medicine, plant-based remedies still play a vital role as a potential source of therapeutic aids in health systems worldwide for both humans and animals (Chakraborty and Pal, 2012) [1].

Giloy is known as a Rasayana plant. It is mentioned as an adaptogen because it enhances the resistance of body to manage physical, biological and chemical stress, also builds energy and general vitality (Salve *et al.*, 2015) [4]. Fenugreek has been traditionally used to enhance milk production in animals, particularly in dairy cows and goats. This herb contains several bioactive compounds that may contribute to its role in improving lactation, regarded as most commonly herbal galactagogue for humans and animals.

Shatavari (*Asparagus racemosus*) stands out as one of the most frequently employed herb in traditional medicine. Its name, "Shatavari," translates to "Curer of a hundred diseases. 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.

### 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. Mineral composition of milk samples obtained from different groups of animals was estimated using the Atomic absorption spectrophotometer. Concentration of minerals i.e. calcium, phosphorus, magnesium, zinc and copper were estimated in the milk samples using standard protocols in laboratory.

### 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)<sup>[7]</sup>.

### Results and Discussion

Mean values of milk minerals profile including Calcium, Phosphorus, Magnesium, Zinc and Copper concentration of Sahiwal cattle have been presented in Table 1. The study reported non-significant effect of dietary supplementation of *Trigonella foenum graecum*, *Tinospora cordifolia* and *Asparagus racemosus* on milk mineral concentration of Sahiwal cattle. Result revealed the increased mean milk calcium concentration in all the herbal supplemented treatment group. However, non significant ( $p>0.05$ ) difference was observed in milk Ca concentration among the group. Highest milk Ca concentration was measured in T<sub>3</sub> followed by T<sub>2</sub> and T<sub>1</sub>. Similarly, phosphorus concentration didn't changed significantly among the groups during the experimental trial. Mean values of magnesium, copper and zinc concentration were differed non significantly ( $p>0.05$ ) among the groups. The observations recorded in the present study are in accordance with the previous findings of Sharma *et al.* (2018)<sup>[5]</sup> and Sharma *et al.* (2019)<sup>[6]</sup>.

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

Attributes	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
Calcium (g/dL)	119.55±1.65	120.77±1.61	120.36±1.33	121.09±1.62
Phosphorus(g/dL)	91.98±2.19	99.63±2.10	96.72±2.03	98.66±2.18
Magnesium(g/ dL)	10.54±0.18	10.45±0.22	10.75±0.21	10.41±0.16
Zinc (µg/ mL)	0.63±0.01	0.65±0.01	0.66±0.01	0.64±0.01
Copper (µg/ mL)	0.06±0.04	0.07±0.01	0.07±0.03	0.06±0.01

### Conclusion

The present study concluded that the herbal feed additives such as Fenugreek seed powder (*Trigonella foenum graecum*), Giloy stem powder (*Tinospora cordifolia*) and Shatavri root powder (*Asparagus racemosus*) at the level of 100 g/day did not significantly influenced the minerals concentration present in milk of Sahiwal cattle. However milk Ca concentration was influenced positively by incorporation of fenugreek seed powder in Sahiwal cattle. Thus it can be safely incorporated in the basal diet of Sahiwal cattle.

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