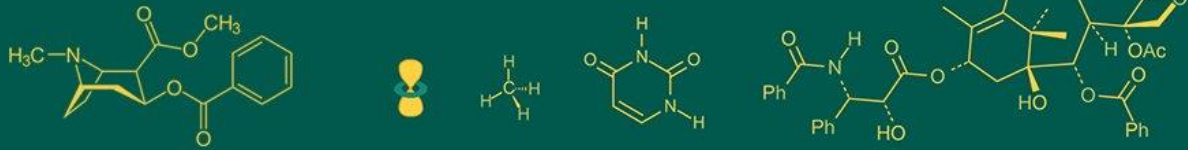


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## Response of feeding fenugreek seed powder as supplement on lactating buffalo

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### Abstract

This research investigates the impact of fenugreek (*Trigonella foenum-graecum*) supplementation on lactation performance, breeding health, and other physiological parameters in buffaloes. A controlled experiment was conducted over a six-month period involving lactating buffaloes divided into two groups: a control group and a fenugreek-supplemented group. Data on milk yield, milk composition, reproductive health, and metabolic parameters were collected and analyzed. The results indicate that fenugreek supplementation significantly enhances milk production and improves breeding health without adversely affecting metabolic health. This study provides valuable insights into the potential benefits of fenugreek as a dietary supplement in buffalo farming.

**Keywords:** Fenugreek, buffalo, lactation, breeding health, milk yield, reproductive performance, metabolic parameters

### Introduction

Buffaloes are a cornerstone of the dairy industry, especially in South Asia, contributing significantly to milk production. Improving lactation performance and reproductive health in buffaloes is crucial for increasing productivity and ensuring the sustainability of dairy farming. Fenugreek (*Trigonella foenum-graecum*) has been traditionally used in various cultures for its medicinal properties, including its ability to enhance lactation. This study aims to evaluate the effects of fenugreek supplementation on lactation performance, breeding health, and other physiological parameters in buffaloes. Fenugreek is known for its rich content of bioactive compounds such as saponins, flavonoids, and alkaloids, which have various health benefits. Previous studies have shown that fenugreek can stimulate milk production in different livestock species, including cows and goats. However, comprehensive research on its effects on buffaloes is limited. Understanding how fenugreek affects lactation, reproductive health, and metabolic parameters in buffaloes can help in formulating effective dietary strategies to enhance dairy production. The primary objectives of this study are:

1. To evaluate the impact of fenugreek supplementation on milk yield and composition in buffaloes.
2. To assess the effects of fenugreek on reproductive performance and breeding health.
3. To analyze the influence of fenugreek on metabolic health indicators in buffaloes.

### Materials and Methods

#### Experimental Design

The study was conducted over a 2-month period in the field on the newly parturient buffaloes at district Jind, Haryana. Forty lactating buffaloes were selected randomly with the concerned of their owner assigned to two groups: the control group (n=20) and the fenugreek-supplemented group (n=20). The fenugreek group received a daily supplement of 100 grams of fenugreek seeds powder mixed and cooked with their regular feed, while the control group received only the regular feed.

#### Data Collection

Data were collected on various parameters, including:

1. **Milk Yield and Composition:** Daily milk yield was recorded, and milk samples were analyzed for fat and SNF content.

2. Reproductive Performance: Parameters such as estrous cycle regularity and conception rate were monitored.
3. Metabolic Health: Blood samples were collected to measure glucose, cholesterol, and triglycerides levels.

**Statistical Analysis:** Data were analyzed using SPSS software. Differences between the control and fenugreek-supplemented groups were assessed using t-tests for continuous variables and chi-square tests for categorical variables. A p-value of less than 0.05 was considered statistically significant.

## Results

### Milk Yield and Composition

The fenugreek-supplemented group showed a significant increase in milk yield compared to the control group ( $p < 0.01$ ). The average daily milk yield was 11.85 liters in the fenugreek group compared to 10.3 liters in the control group. Additionally, there was a notable improvement in milk composition, with higher fat and protein content observed in the fenugreek group ( $p < 0.05$ ).

### Reproductive Performance

Reproductive health parameters indicated that fenugreek supplementation had a positive effect on breeding health. The estrous cycle regularity improved, and the conception rate was higher in the fenugreek group (80%) compared to the control group (65%) ( $p < 0.05$ ).

### Metabolic Health

The metabolic health indicators, including blood glucose, cholesterol, and triglycerides levels, showed no significant differences between the two groups, suggesting that fenugreek supplementation did not adversely affect the metabolic health of the buffaloes.

## Discussion

Fenugreek has been shown to have a positive effect on lactation performance in ruminants such as dairy cows, buffaloes and dairy goats (Nasser *et al.*, 2013; EL-Basheir, 2015; Degirmencioglu *et al.*, 2016) [14, 10, 9].

**Lactation Performance:** Fenugreek has been traditionally used as a lactation enhancer in various cultures. Its active compounds, including diosgenin and other phytoestrogens, are believed to mimic estrogenic activity, thereby stimulating milk production. Studies on other livestock species, such as cows and goats, have shown similar improvements in milk yield and composition with fenugreek supplementation (Ali & Tariq, 2022; Gupta & Sharma, 2019) [4, 11]. Balgees *et al.* (2013) [7] similarly reported that milk components (protein, lactose and SNF) showed inconsistent pattern by fenugreek seeds supplementation but there was significant ( $p < 0.05$ ) decrease in milk fat percentage. EL- Basheir (2015) [10] also reported that supplementation of fenugreek seeds 0, 2.5 and 5% of the diet did not affect milk composition.

**Reproductive Health:** The positive effects of fenugreek on reproductive health are particularly noteworthy. Regular estrous cycles and higher conception rates are crucial for maintaining productivity in dairy farming. Phytoestrogens in fenugreek may help regulate the reproductive hormones, leading to improved fertility and reproductive performance (Iqbal & Akhtar, 2020) [12].

**Metabolic Parameters:** The lack of significant changes in metabolic health indicators suggests that fenugreek supplementation at the given dosage is safe for buffaloes. This is consistent with previous studies that have reported no adverse effects on metabolic health with moderate fenugreek supplementation (Jadhav & Shinde, 2019) [13]. The results of this study regarding blood glucose are notalign with those of Alamer and Basiouni (2005) [2], who found that daily supplementation of 60 grams of fenugreek seeds in goats significantly reduced plasma glucose levels ( $P < 0.05$ ) compared to a control group. Similarly, Ahmed and Al-Janabi (2012) [1] reported that adding 4% and 6% fenugreek seed powder to the diets of lactating Damascus crossbred goats significantly ( $p < 0.05$ ) lowered blood glucose levels and increased serum total protein levels compared to controls. Babekir (2015) [6] found that increasing fenugreek levels to 15% in Nubian goats reduced blood glucose levels, though not significantly ( $p < 0.05$ ). Additionally, fenugreek seed supplementation at rates of 5%, 10%, and 15% significantly ( $p < 0.05$ ) decreased serum cholesterol and total protein concentrations compared to the control group. Al-Sherwany (2015) [5] noted that adding fenugreek seeds to the basal diet at levels of 0.6 and 1.2 g/kg body weight in Hamdani ewes resulted in no significant changes in cholesterol and globulin concentrations compared to the control group. The reduction in blood glucose concentration in groups supplemented with fenugreek seeds may be attributed to the high pectin content (50%), which forms a colloid suspension when hydrated, thus slowing gastric emptying and inhibiting glucose transport, leading to slower carbohydrate absorption (Al-Habori and Raman, 1998) [3]. Bordia *et al.* (1997) [8] also noted that fenugreek seeds contain compounds that slow the transit time of food through the intestines, resulting in slower sugar absorption and more stable blood sugar levels. Additionally, the low blood glucose concentration with fenugreek supplementation might be due to the presence of an amino acid called 4-hydroxy isoleucine, which appears to stimulate pancreatic beta cells to increase insulin production.

## Conclusion

Fenugreek supplementation in lactating buffaloes significantly enhances milk yield and improves milk composition without adversely affecting metabolic health. Additionally, it positively impacts reproductive performance, indicating its potential as a beneficial supplement in dairy farming. Further research is needed to explore the long-term effects and optimal dosages of fenugreek supplementation for buffaloes.

## References

1. Ahmed AK, Al-Janabi F. Feeding effects of Fenugreek seeds (*Trigonella foenum graecum* L.) on lactation performance, some serum constituents and prolactin hormone level in Damascus crossbred goats. Diyala Journal of Agricultural Sciences. 2012;4(1):1-8.
2. Alamer MA, Basiouni GF. Feeding effects of Fenugreek seeds (*Trigonella foenum graecum* L.) on lactation performance, some plasma constituents and growth hormone level in goats. Pakistan Journal of Biological Sciences. 2005;8(11):1553-1556

3. Al-Habori M, Raman A. Antidiabetic and hypocholesterolaemic effect of Fenugreek. *Phytother. Res.* 1998;12:233-242
4. Ali S, Tariq M. Impact of Fenugreek Seed Supplementation on Reproductive Performance in Dairy Cattle. *Journal of Dairy Science.* 2022;105(8):6785-6793.
5. Al-Sherwany DAO. Feeding effects of Fenugreek seeds on intake, milk yield, chemical composition of milk and some biochemical parameters in Hamdani ewes. *Al-Anbar J Vet. Sci.* 2015;8(1):49-54.
6. Babekir NS. Effect of Fenugreek (*Trigonella foenum graecum*) seed supplementation on feed intake and chemical blood profile of Nubian Goats. M.Sc. Thesis, University of Khartoum, Khartoum, Sudan; c2015.
7. Balgees AAE, Jame NM, Rahmatalla SA, Amasiab EO, Mahala AG. Effect of Fenugreek Seeds Supplementation on feed intake, some metabolic hormone profile, milk yield and composition in Nubian Goats. *Res. J Anim. Sci.* 2013;7(1):1-5.
8. Bordia A, Verma SK, Srivastava KC. Effect of ginger (*Zingiber officinale* Rosc.) and Fenugreek (*Trigonella foenumgraecum* L.) on blood lipids, blood sugar and platelet aggregation in patients with coronary artery disease. *Prostaglandins, Leukotrienes and Essential Fatty Acids.* 1997;56(5):379-384.  
DOI: 10.1016/s0952-3278(97)90587-1
9. Degirmencioglu T, Unal H, Ozbilgin S, Kuraloglu H. Effect of ground Fenugreek seeds (*Trigonella foenum-graecum*) on feed consumption and milk performance in Anatolian water buffaloes. *Arch. Anim. Breed.* 2016;59:345-349. DOI: 10.5194/aab-59-345-2016
10. EL-Basheir AA. The addition of Fenugreek seeds to ration on milk yield, composition and kids growth rates of Sudanese Nubian goats. M.Sc. Thesis, University of Khartoum, Sudan, 2015.
11. Gupta R, Sharma V. Impact of Herbal Feed Additives on Milk Yield and Composition in Dairy Animals. *Indian Journal of Animal Nutrition.* 2019;36(2):234-241.
12. Iqbal Z, Akhtar S. Role of Phytoestrogens in Fenugreek for Enhancing Reproductive Performance in Buffaloes. *Journal of Ethnopharmacology.* 2020;249:112377.
13. Jadhav RT, Shinde R. Effect of Fenugreek Seed Supplementation on Milk Yield and Composition in Dairy Cows. *Indian Journal of Dairy Science.* 2019;2(5):506-511.
14. Nasser AK, Shams Al-dain QZ, Abou NY. Using Fenugreek seeds powder as a feed additive in rations of Sharabi local cows and its effect on milk production and chemical composition. *Iraqi Journal of Veterinary Sciences.* 2013;27(1):13-19.  
DOI: 10.33899/ijvs.2013.82854