



Research Article

Awareness, utilization pattern and constraints of dairy farm women regarding fodder crops in Belgavi district of Karnataka, India

Bhoomika J. S.¹ Geeta P. Channal^{1*} and Nagaratna Biradar²

¹University of Agricultural Sciences, Dharwad-580005, India

²ICAR-Indian Grassland and Fodder Research Institute, Southern Regional Research Station, Dharwad-580005, India

*Corresponding author email: geetrajpatil@yahoo.co.in

Received: 8th March, 2026

Accepted: 15th April, 2026

Abstract

Fodder production and utilization play a crucial role in sustaining livestock productivity and enhancing dairy income. The present study assessed the level of awareness, utilization patterns, and constraints faced by livestock farmers regarding fodder cultivation and management practices. The findings revealed that a majority of respondents (82.50%) had a medium level of awareness and an overall awareness index of 45.95. While respondents were highly aware that fodder seeds and planting materials are not commonly sold by seed companies (96.66%) and that fodder cultivation is cheaper than food crops (77.50%), awareness was considerably low regarding leguminous fodder benefits, soil fertility improvement, and milk yield enhancement. Traditional practices such as manual chaffing and direct feeding were moderately adopted, whereas improved technologies like urea treatment, silage making, hay making, and fodder enrichment practices were never used by the respondents. The major constraints identified included the non-availability of quality fodder seeds and planting materials in local markets, a lack of extension services and inadequate information about improved varieties and cultivation practices. The study highlights the urgent need for strengthened extension interventions, improved input supply systems, and capacity-building programs to enhance fodder production and scientific utilization practices.

Keywords: Awareness, Constraints, Dairy farm women, Fodder crops, Utilization pattern.

Introduction

Livestock farming constitutes an integral component of Indian agriculture, contributing significantly to rural livelihoods, nutritional security, and women's empowerment—an aspect particularly relevant in smallholder farming systems. Adequate availability of quality fodder is fundamental for improving milk yield, animal health, and overall farm profitability. As per estimate, the nation faces a net deficit of green fodder (221 MT), dry fodder (104 MT) and 29 MT concentrate feed ingredients (Anonymous, 2015). This has adversely affected the growth, health, reproduction and production potential of animals. However, fodder scarcity, low productivity, and poor adoption of improved fodder management practices remain major challenges in the livestock sector. The shortage of fodder crops can be attributed to the reason that Indian farmers are currently focusing more on growing food grains, oilseeds and cash crops because of a higher benefit-cost ratio, while

fodder crop production remains highly neglected. Fodder crops, including grasses and legumes, offer multiple benefits such as soil fertility improvement, erosion control, weed suppression, and cost-effective feed production. Scientific practices like silage making, hay preparation, urea treatment, and proper grass-legume mixtures can significantly enhance feed quality and year-round availability. Despite these advantages, the adoption of improved fodder technologies largely depends on farmers' awareness, access to quality inputs, and extension support.

Since dairy is women dominant sector, the process of dairy development would be imperfect and unbalanced, unless dairy farm women are fully involved in it including production and use of fodder crops. For successful implementation of dairy development programmes, it is imperative to know the constraints experienced by dairy farm women in fodder production and utilization.

With this background, the study was undertaken with the objectives to assess the level of awareness regarding improved fodder crops, the utilisation pattern of fodder crops, and the constraints faced by dairy farm women regarding fodder crops.

Materials and Methods

Study area and selection of respondents: Secondary data on the Livestock population of all districts of Karnataka based on the recent livestock census (2019) were collected (Anonymous, 2019). Since Belagavi district had highest livestock population of the state, this district was selected for the study. Out of ten taluks in this district, two taluks Gokak and Raybag-were selected based on the highest women dairy cooperative members. Two villages were randomly selected from each taluk, and 30 dairy farm women were randomly selected from each village. Thus, the study covered four villages (Neeralkudi and Mugholkhod from Raybag and Bisankoppa and Khanatti from Gokak taluks) and 120 dairy farm women.

Study design and tools: The present study employed a survey research design. An interview schedule was prepared based on the study objectives and this was pre-tested in non-sample area to find out any ambiguities. The pre-tested and standardized interview schedule was used to collect data from the respondents (dairy farm-woman) through a personal interview technique.

Data analysis: The gathered data was measured using appropriate scores and analyzed with suitable statistical tools like frequency, percentage, standard deviation, awareness index and Garrett ranking was used to draw meaningful inferences. The awareness index was determined by seeking responses from respondents for 14 statements framed to measure awareness. These statements cover different aspects of fodder cultivation from seed availability to harvest. Responses were obtained as aware and not aware against each statement, scored as 1 and zero, respectively with highest possible score of 14 and a lowest of zero. Respondents were grouped into three categories as low, medium and high using class intervals. Furthermore, based on the score obtained by the respondent awareness index was worked out by using the following formula:

$$\text{Awareness index} = \frac{\text{Scores obtained}}{\text{Obtainable score}} \times 100$$

Seven possible constraints in the cultivation of fodder crops were listed in the interview schedule, and responses were obtained for these constraints by assigning ranks. Based on these ranks, percent position was arrived at by using the following formula:

$$\text{Percent position} = 100 (R_{ij}) - 0.5 / N_j$$

Where, R_{ij} = Rank given for the i^{th} variable by j^{th} respondent; N_j = Number of variables ranked by the j^{th} respondent

By referring the Garret table, the percentage position estimated was converted into scores. For each of the constraint, the scores of every individual are added and the mean scores are computed. Constraint with highest Garret score was assigned first rank and with least Garret score was given last rank. A list of constraints, along with Garrett scores and ranks were presented in tabular form.

Results and Discussion

Awareness level of respondents about fodder crops: Table 1 reveals that a large majority of the respondents (82.50%) possessed a medium level of awareness regarding fodder crops, while only 12.50% had a high level of awareness. A negligible proportion (5.00%) of respondents fell under the low awareness category. The predominance of medium awareness implies that farmers have basic knowledge about fodder crops but lack a comprehensive understanding of improved fodder production and utilization practices. This suggests that, although most farmers are moderately informed about fodder crops, there is substantial scope to enhance their awareness through focused extension interventions, particularly to elevate them from medium to high awareness levels. The predominance of medium awareness may be due to limited exposure of farmers to structured training programmes and scientific extension services, resulting in only basic knowledge of fodder crops. Inadequate access to timely technical information, improved varieties, and demonstrations may have restricted farmers from gaining a deeper understanding of advanced fodder production and utilization practices. Continued dependence

Table 1. Dairy farm women's level of awareness about fodder crops

Sl. No.	Level of awareness	Percentage	Percentage
1.	Low (<04)	06	05.00
2.	Medium (04-09)	99	82.50
3.	High (>09)	15	12.50
	Mean = 07.40	SD = 01.90	

on traditional practices and informal knowledge sources, may have limited the transition from medium to high levels of awareness.

Awareness of respondents on different aspects of fodder cultivation: The results presented in Table 2 reveal that most (96.66%) of the dairy farm women were aware that fodder seeds and planting material of fodder crops are not sold by private companies. The main reasons for this situation are that no private companies produce and sell seeds of perennial fodder crops due to factors such as bulkiness of seed, low germination percentage, and staggered maturity of the seed crop. Three-fourths of the respondents (77.50%) were aware that fodder cultivation is cheaper than food crops. One reason for this is that everyone cultivates Bajra Napier hybrid and has experienced that this crop, in particular, and fodder crops in general, have almost negligible pest and disease attacks. The majority (71.66%) were aware that there are annual and perennial types of fodder crops, which could be attributed to the adoption of fodder crops in the region. The study area is a sugarcane-growing belt, and fodder crops are cultivated on waterways and bunds. This might have helped respondents observe that growing these crops reduces soil erosion, which could be the reason why 67.50% were aware that fodder crops arrest soil erosion. Availability of irrigation throughout the year and experience in fodder cultivation could be the reasons why 54.16 and 49.16% of respondents were aware of the time of sowing and sowing methods of fodder crops.

In contrast, awareness was low regarding certain aspects: fodder crops cannot be grown in waterlogged conditions

(40.83%), fodder crops can be grown in both rainfed and irrigated conditions (40.00%), fodder crops cannot be dried and stored for future use (32.50%), and the right time to harvest fodder crops (27.50%). About one-fourth were aware that fodder crops can be grown in all types of land (26.66%) and that fodder crops are classified as pulses and grasses (24.16%). Only a few (19.16 and 15.00%) were aware that leguminous fodder crops improve soil fertility and increase milk yield, respectively. Limited extension support specifically focused on fodder crops may have restricted farmers' access to scientific knowledge, leading to higher awareness of basic aspects and lower awareness of technical practices. Absence of dedicated agencies for fodder technology dissemination and fragmented institutional focus (crop vs. livestock departments) may have resulted in gaps in comprehensive knowledge transfer to farmers. While the state agriculture department focuses on major crops of the area, the state department of animal husbandry and veterinary services mainly focuses on animal treatment. The study revealed poor knowledge about high-yielding varieties, land preparation and bio-fertilizers, while the majority had more knowledge about critical stages of irrigation (Satyapriya *et al.*, 2013). Only a few dairy farmers were aware of advanced technologies like silage making, complete feed block, urea ammonization of crop residues, bypass protein and bypass fat feeding (Naik *et al.*, 2012). The study indicates that the maximum percentage of respondents belonged to the medium level of knowledge category about improved fodder practices of Sorghum (Meena *et al.*, 2017). Awareness about the technical aspects of fodder crops is generally low. So,

Table 2. Awareness of fodder crops by dairy farm women (n=120)

SI No.	Awareness	Frequency	Percentage
1.	Fodder seeds and planting material are not sold by seed companies	116	96.66
2.	Cultivation of fodder crops is cheaper as compared to food crops	93	77.50
3.	There are annual and perennial types of fodder crops	86	71.66
4.	Fodder crops can arrest soil erosion and suppress weeds	81	67.50
5.	Fodder crops can be planted or sown during any season of the year	65	54.16
6.	Fodder crops can be sown either through broadcasting or dibbling	59	49.16
7.	Fodder crops can be grown in waterlogged condition	49	40.83
8.	Fodder crops can be grown in both rain fed and irrigated conditions	48	40.00
9.	Most of the fodder crops cannot be dried and stored for the future use	39	32.50
10.	Right time to harvest fodder crops is at flowering stage	33	27.50
11.	Fodder crops can be grown in all types of land	32	26.66
12.	Fodder crops are categorized as grasses and pulses	29	24.16
13.	Leguminous fodder crops help to increase milk yield	23	19.16
14.	Cultivation of leguminous fodder crops improves the soil fertility	18	15.00
Awareness index		45.95	

there is a need to increase awareness by conducting need-based trainings, method demonstrations, field days, exhibitions etc.

Utilization pattern of fodder by respondents:

Table 3 shows that direct feeding of green fodder was regularly practiced by 30.83% of respondents, while 49.17% never practiced it. Chaffing of fodder using manually operated chaff cutters was more common, with 46.67% regularly using them for green fodder, compared to only 22.50% who regularly used power-operated chaff cutters. In the case of dry fodder, manual chaffing was again more prevalent, with 49.17% practicing it regularly. Advanced fodder management practices such as urea treatment, soaking of dry fodder, jaggery or salt water treatment, hay making, and silage making were completely absent among respondents, as none reported practicing these methods either regularly or occasionally. The combined use of green and dry fodder through chaffing was limited, with only 22.50% practicing it regularly. The recommended grass-legume mixture ratio (2:1) was followed regularly by only 2.50%, while a vast majority (95.83%) never adopted this practice. Overall, the findings indicate low adoption of scientific fodder utilization practices, highlighting the need for

intensive training and demonstrations. The probable reason for these findings is that respondents aimed to utilize fodder more efficiently and enhance its digestibility through chaffing. Additionally, some farmers with large herd sizes procured chaff cutters either through subsidies or from their own resources.

It can be concluded that the majority of farmers provided fodder after chaffing because it prevents wastage of green fodder and improves its utilization by animals. A large majority of the women did not know about feeding grass-legume mixtures proportionately, as only a meager percentage were aware of the significance of pulse fodder crops. Furthermore, none of the respondents were aware of fodder enrichment, probably due to a lack of scientific knowledge about improved fodder utilization methods. Only one-third of the dairy farm women practiced direct feeding of green and dry fodder, as it requires more physical effort compared to watering and feeding. The study also observed that decision-making in the study area was mainly male-dominated. Limited awareness and lack of technical knowledge about improved fodder utilization practices (such as silage making, hay preparation, and fodder enrichment) may have resulted in very low adoption of scientific methods. Easy availability and familiarity with traditional practices like manual chaffing, along with perceived benefits such as reduced wastage and better digestibility, may have encouraged

Table 3. Utilization patterns of fodder crops by dairy farm women (n= 120)

Sl. No.	Utilization pattern	Frequency of practice		
		Regularly	Occasionally	Never
1. Green fodder				
a.	Direct feeding	37 (30.83)	24 (20.00)	59 (49.17)
b.	Chaffing			
	Power operated	27 (22.50)	0 (0.00)	93 (77.50)
	Manually operated	56 (46.67)	27 (22.50)	37 (30.83)
2. Dry fodder				
a.	Direct feeding	32 (26.67)	18 (15.00)	70 (58.33)
b.	Chaffing			
	Power operated	27 (22.50)	0 (0.00)	93 (77.50)
	Manually operated	59 (49.17)	29 (24.16)	32 (26.67)
3.	Chaffing green and dry fodder	27 (22.50)	0 (0.00)	93 (77.50)
4.	Urea treatment for fodder	0 (0.00)	0 (0.00)	0 (0.00)
5.	Soaking the dry fodder (7-8 hours)	0 (0.00)	0 (0.00)	0 (0.00)
7.	Jaggery treatment for fodder	0 (0.00)	0 (0.00)	0 (0.00)
8.	Salt water treatment for fodder	0 (0.00)	0 (0.00)	0 (0.00)
9.	Haymaking	0 (0.00)	0 (0.00)	0 (0.00)
10.	Silage making	0 (0.00)	0 (0.00)	0 (0.00)
11.	Ratio of grass legume mixture (2:1)	3 (02.50)	2 (01.67)	115 (95.83)

their continued use over advanced technologies. Limited access to machinery, inadequate training support, and male-dominated decision-making may have restricted women from adopting improved and labor-intensive practices.

The findings suggest that a greater dry fodder deficit in peri-urban areas might be due to the prevalence of a higher percent of crossbred animals, leading to increased fodder requirements. Limited land holding and cultivation of commercial crops are the other reasons for fodder deficiency in peri-urban areas (Pushpa *et al.*, 2009). The study revealed that neither trained nor untrained farm women had adopted silage making, hay making and practicing the soaking of dry fodder (chaffed) in water (Maheshwari, 2015). The green fodder consumption was highest (16.83 kg/day/family) while top feed was least utilized (Quershi *et al.*, 2014). The study documented 165 plant species of fodder. Of these, 30 species were used in summer, 32 in winter, 47 in the rainy season and 28 species were used in all three seasons. Among the recorded species, 148 were used as green fodder, five as dry fodder and the remaining were used as both green and dry fodder (Nautiyal *et al.*, 2018). It can be seen that fodder utilization depends on resource availability in the region and season, and the majority of the farmers are unaware of improved utilization methods.

Constraints faced by respondents in fodder cultivation: The constraint analysis based on Garrett ranking technique shows that non-availability of fodder seeds and planting material in the local market was perceived as the major constraint and ranked I with a mean Garrett score of 73.27. The possible reasons for this is fodder seed production in our country is done only by government agencies and many times they might not be producing seed of the entire fodder crop. Even if being produced, they may not be in adequate quantity. Apart from that few are vegetatively propagated and needed large quantity of root slips to cover a unit area. The problem of no extension services pertaining

to improved fodder crops was ranked II with a mean Garrett score of 57.55. No extension services regarding improved fodder crops ranked II with a mean Garrett score of 57.55. The predicted reasons for this constraint might be that extension professionals are too limited in disseminating information in these fields. While state agriculture departments concentrate on extending technologies of major crops of the area, the department of animal husbandry emphasis is on clinical or veterinary aspects of livestock. Thus, the extension of fodder technological know-how is suffering. This was followed by a lack of information about the latest varieties of fodder crops and improved cultivation practices (III rank, 52.00 Garrett score) & lack of information about hay and silage making (IV rank, 46.40 Garrett score). The reason behind these results are they are not aware of the suitable management technologies like conservation and utilization of fodder crops because of the limited number of demonstrations, training, workshops and farm visits planned exclusively on fodder-based technologies. Another reason might be that farm women generally attend extension programs to a limited extent, resulting in poor awareness. Cultivating fodder crops is labor-intensive and expensive. Fodder seeds were ranked V by the farmers with a mean Garrett score of 42.79. Due to less production and high demand, fodder seeds are expensive. Fodder crops need to be harvested at regular intervals. So farm women might have felt this as a constraint. Not having enough space for growing fodder crops ranked VI with a mean Garrett score of 33.49. Land shortage for growing fodder crops is one of the constraints because small farmers who have very little land concentrate only on growing cash crops and food crops to lead a better livelihood. and the last constraint (VII) was water scarcity for growing fodder crops during summer, with a mean Garrett score of 29.65. Reason could be that the preference of farmers to use available irrigation in summer is mainly for the cash crop of the region (Sugarcane), which requires more water in summer. The constraints faced by farm women in relation to management were that the majority of

Table 4. Constraints faced by the dairy farm women regarding fodder crops (n= 120)

Sl. No.	Constraints	Mean Garret scores	Rank
1.	Non-availability of fodder seeds and planting material in local market	73.27	I
2.	No extension services regarding improved fodder crops	57.55	II
3.	Lack of information about latest varieties of fodder crops and improved cultivation practices	52.00	III
4.	Lack of information about hay and silage-making methods and lack of knowledge on enrichment of dry fodder	46.40	IV
5.	Cultivating fodder crops is labor-intensive and fodder seed are expensive	42.79	V
6.	Not enough space for growing the fodder crops	33.49	VI
7.	Water scarcity for growing fodder crops during summer	29.65	VII

dairy farm women expressed a lack of knowledge on preparation of concentrates locally (89.17%), followed by non-availability of required concentrates (82.50%) and lack of training on clean milk production and dairy management (80.83%) as major constraints (Nataraju *et al.*, 2016). Lack of access to dairy cooperatives and overgrazing were constraints observed by Manjunath *et al.* (2025).

The results revealed that 'inadequate credit facilities for purchasing necessary inputs', 'lack of on-farm trial and training on latest fodder crop cultivation methods' and 'destruction of fodder crops by wild boar' were the first (84.07%), second (83.43%) and third (80.00%) prominent constraints, respectively, perceived by the farmers of north Gujarat about fodder production.

(Panchbhai *et al.*, 2017). The study stated that small landholding followed by lack of irrigation is the primary constraint for less adoption of fodder technology in the area (Suman *et al.*, 2017). The findings indicate that fodder production is constrained by the non-availability of fodder seeds and planting material, lack of extension services like training and extension support value addition of fodder, limited space for growing fodder. Additionally, small landholdings and high cost of seeds further hinder the adoption of improved fodder technologies. Overall, strengthening institutional support and capacity-building efforts is essential to enhance fodder development.

Conclusion

The study reveals that while livestock farmers demonstrate a moderate level of awareness regarding fodder crops, there are clear and critical knowledge gaps in several important areas. Farmers have a limited understanding of the role of leguminous fodder in improving soil fertility, enhancing milk production, and contributing to balanced animal nutrition. In addition, awareness of scientific fodder conservation practices—such as silage preparation, hay making and nutrient enrichment techniques—remains inadequate. This indicates that dairy farm women have to adopt scientific fodder management practices than the traditional methods. Fodder utilization patterns continue to be largely traditional in nature. Most farmers rely on conventional methods such as manual chaffing and direct feeding, with little to no adoption of improved technologies. The absence of practices like silage making, urea treatment, and fodder fortification highlights a significant gap between recommended practices and field-level adoption. This reflects not only limited awareness but also restricted access to technical guidance and inputs. The study further identifies several practical constraints that hinder effective fodder production and utilization. Key challenges include the non-availability of quality fodder seeds at the right time, inadequate reach of extension services, and insufficient

access to reliable technical information about improved fodder varieties and scientific management practices. These constraints collectively limit farmers' ability to adopt innovations and improve livestock productivity. The findings emphasize the need for a multi-pronged intervention strategy. Strengthening extension systems is essential to ensure regular farmer engagement through training programs, field demonstrations, and exposure visits. Improving the supply chain for quality fodder seeds and planting materials must be prioritized to support timely cultivation. Capacity-building initiatives should focus on practical, hands-on training in fodder conservation techniques and balanced feeding practices.

References

- Anonymous. 2015. The 34th Report of Parliamentary Standing Committee on Agriculture, Estimates based on livestock censuses published by the directorate of Economics & statistics, Department of Animal husbandry & Dairying, New Delhi. pp. 2-4.
- Anonymous. 2019. Key results of 20th Livestock Census-2019. Ministry of Fisheries, Animal Husbandry and Dairying, posted on 16 October, 2019, by pibindia (<https://pib.gov.in>).
- Maheshwari, D. K. 2015. Dairy management practices adopted by dairy farm women of self-help groups in Gadag district. M Sc (Ag) Thesis, University of Agricultural Sciences, Dharwad, Karnataka (India).
- Manjunatha, B. L., M. Sureshkumar, Dipika Hajong, R. S. Shekhawat and S. P. S. Tanwar. 2025. Historical changes affecting pastoralism in Banni grasslands and contemporary priorities of the pastoralists. *Range Management and Agroforestry* 46 (1): 8-15.
- Meena, D. K., G. Sankhala, P. S. Chauhan and M. Meena. 2017. Knowledge of farmers about improved fodder production practices in Rajasthan state of India. *International Journal of Current Microbiology and Applied Sciences* 6: 2013-2025.
- Naik, P. K., R. B. Dhuri, B. K. Swain and M. Karunakaran. 2012. Analysis of dairy farming in Goa. *Indian Journal of Animal Sciences* 83: 299-303.
- Nataraju, B. Y., K. Jagadeeshwara, V. L. Madhu Prasad and N. Rajanna. 2016. Profile and constraints of dairy farm women. *Mysore Journal of Agricultural Sciences* 50: 770-772.
- Nautiyal, M., J. K. Tiwari and S. R. Rawat. 2018. Fodder diversity, availability and utilization pattern in Garhwal Himalaya, Uttarakhand. *Plant Archives* 18: 278-287.
- Panchbhai, G. J., M. F. Siddiqui, M. N. Sawant, A. P. Verma and J. Parmeswaranaik. 2017. Constraints faced by cooperative dairy farmers in adoption of recommended dairy management practices. *International Journal of Current Microbiology and Applied Sciences* 6: 1962-1966

- Pushpa, P., N. Biradar, S.N. Hanchinal and L. V. Hirevenkanagoudar. 2009. Fodder management systems of peri-urban and rural livestock owners of Belgaum district of Karnataka state, India. *Range Management and Agroforestry* 30: 81-84.
- Quereshi, S., S. Akther and P. Malaviya. 2014. Resource utilization pattern with special reference to fodder and fuel in village Shahdara district Rajouri (J&K). *Current World Environment* 10: 232-237.
- Satyapriya, R. K. Agrawal, P. Sharma, M. Singh and S. Kumar. 2013. Knowledge level of fodder cultivating farmers about Berseem production technology. *Range Management and Agroforestry* 34: 73-76
- Suman, M., V. Kumar, and A. Kumar. 2017. Study of farmers' perception constraints for lesser adoption of fodder production technologies and ways to improve the adoption in Bundelkhand region. *Agricultural Science Digest - A Research Journal*. 37(2): 166-167.