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Indigenous livestock feeding protocols and associated socio-economic profile of dairy farmers in South Kashmir: A study from district Shopian

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ABSTRACT

A comprehensive survey was conducted in district Shopian of South Kashmir to assess the socio-economic profile of dairy farmers, their indigenous feeding practices and the chemical composition of available feedstuffs. Using a pre-tested approved schedule, 162 farmers from villages across six tehsils were randomly interviewed. Samples of feeds and fodders most commonly offered to the dairy cattle were collected separately, pooled and analysed. Most of the farmers in the district practised horticulture as primary occupation (28.40%) followed by animal husbandry (22.22%) predominantly dairying (55.56%), and only 29.01% had middle school level of education. The majority (64.81%) of famers had a monthly income level of 10000-20000/- from dairy sector and the average land holdings per household ranged between <1 acre (69.14%) and 1-5 acres (30.86%). Complete stall feeding with only dry fodder was practised during winter, while during summer, 83.33% of the farmers offered mixed feed (green + dry). Only 14.81% of the respondents reported usage of silage in diets of dairy cattle. About 93.21% of the dairy farmers fed un-chaffed fodders to their animals. Concentrate feeding to the dairy animals was practised by majority (84.57%) of the farmers among which 75.31% were offering commercial compound feed. Majority (83.33%) of the farmers supplemented the diet of animals with mineral mixture. The available feedstuffs for dairy cattle were nutritionally adequate. It is concluded that dairy farmers in Shopian despite having small land holdings and reliance on traditional feeding practices, ensured nutritionally adequate diets through supplementation of concentrates feeds and mineral mixtures; however, minimal technological awareness highlighted the need for scientific interventions in dairy farming to improve milk productivity in the region.

Keywords: Dairy farmers, Feed composition, Indigenous practices, Socio-economic profile, South Kashmir

Among agriculture and allied sectors, dairying alone contributes around 5% to the national Gross Domestic Product, and plays a significant role in the country's economy and rural livelihoods. India has the world's largest dairy animal population (303.76 million bovines), producing 247.87 million tonnes (in 2024-25) of milk annually which accounts for 24% of the global milk production and ranks first in the world's total milk production (DAHD 2026). The dairy sector plays a pivotal role in the social and economic development of rural India, providing a regular source of income to the rural households, generates employment opportunities for women, reduces poverty, and helps in achieving food security (Jaiswal *et al.* 2018).

In India, the dairy sector faces several constraints including low individual productivity, nutritional deficiencies, less fat in milk and disease outbreaks, etc. The traditional farming and feeding practices mainly adopted by the dairy farmers contribute significantly to low productivity of animals (Quddus 2012, Karki and Ansari 2023). Poor quality with low nutritional value of feeds and fodders offered to the dairy animals also lead to reduction in productivity (Ali *et al.* 2021). Besides socio-economic profile of dairy farmers influencing their ability to adopt improved technologies, efficient feeding and management systems play an important role in enhancing milk production (Sharma *et al.* 2023). To boost milk productivity and make dairying more remunerative, it is imperative to adopt scientific dairy feeding practices for which understanding of the farmers' socio-economic status, traditional feeding practices being followed and nutritional quality of offered feeds are crucial. Hence the present study was conducted to assess the indigenous knowledge of feeding animals *vis-a-vis* associated socio-economic factors in dairy farming and chemical composition of feed resources available in district Shopian of Kashmir valley.

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MATERIALS AND METHODS

Study area: The present study was carried out in district Shopian of Kashmir Division. The district is situated in the

laps of foothills of Pir Panchal range, located in the South of Kashmir valley at 33°43″ N latitude, 74°49″ E longitude, and an elevation of 2146 meters above sea level, and most of its area is hilly. The district is divided into two veterinary blocks, namely Shopian and Keller, as per classification of Department of Animal Husbandry-Kashmir, Government of Jammu and Kashmir, each comprising several tehsils with a combined total of 75 panchayats, and 133 villages. In the present study, 5 tehsils (Shopian, Imam-sahab, Herman, Zainpora and Chitragam) from Shopian veterinary block and 1 tehsil (Keegam) from Keller veterinary block were randomly selected, representing the area with a significant breedable cattle population in the district.

Experimental procedure: A comprehensive history regarding the socio-economic status and traditional feeding practices adopted by dairy farmers in the district was collected using a pre-tested interview schedule. Based on breedable cattle population in the tehsils of Shopian, Imam-sahab, Herman, Zainpora, Chitragam and Keegam, a respective number of 24, 30, 31, 25, 22 and 30 (totalling 162 in the district) dairy farmers (respondents) owning two or more milch animals were selected by applying stratified random sampling procedure and questioned. Tehsils within the district were first stratified according to their breedable cattle population, ensuring that the selected areas were true representative of zones with meaningful cattle-rearing activity relevant to the study objectives. Tehsils were then selected at random from within this stratified framework, thereby ensuring both representativeness and methodological rigor, while avoiding any bias that could arise from purely random selection across the entire district irrespective of cattle density.

The respondents were personally interviewed preferentially in the morning to ensure accessibility and foster cooperation with the farmers, facilitating comprehensive data collection. Samples of feeds and

Table 1. Socio-economic profile of dairy farmers in district Shopian of Kashmir

Parameter	Attribute		Block Shopian				Block Keller		Dist. ave. (n=162)	p value
			Shopian (n=24)	Imam-sahab (n=30)	Herman (n=31)	Zainpora (n=25)	Chitragam (n=22)	Keegam (n=30)		
Primary occupation of dairy farmers	Horticulture		7 (29.17)	7 (23.33)	10 (32.26)	6 (24.00)	8 (36.36)	8 (26.67)	46 (28.40)	0.904
	Animal husbandry		4 (16.67)	7 (23.33)	9 (29.03)	6 (24.00)	4 (18.18)	6 (20.00)	36 (22.22)	0.899
	Dairy farming		3/4 (75.00)	4/7 (57.14)	6/9 (66.67)	4/6 (66.67)	1/4 (25.00)	2/6 (33.33)	20/36 (55.56)	0.538
	Govt. service		3 (12.50)	5 (16.67)	4 (12.90)	4 (16.00)	3 (13.64)	6 (20.00)	25 (15.43)	0.971
	Business		6^{b} (25.00)	5^{b} (16.67)	2^{a} (6.45)	3^{ab} (12.00)	1^{a} (4.55)	0^{a} (0.00)	17 (10.49)	0.042
	Labour		1 (4.17)	3 (10.00)	2 (6.45)	2 (8.00)	2 (9.09)	3 (10.00)	13(8.02)	0.967
	Others (Artisan, Household etc.)		1 (4.17)	2 (6.67)	2 (6.45)	2 (8.00)	1 (4.55)	5 (16.67)	13 (8.02)	0.541
	Agriculture		2 (8.33)	1 (3.33)	2 (6.45)	2 (8.00)	3 (13.64)	2 (6.67)	12 (7.41)	0.838
Household income from dairy farming (Rs. /month)	< 10000/-		4 (16.67)	6 (20.00)	8 (25.81)	4 (16.00)	6 (27.27)	9 (30.00)	37 (22.84)	0.762
	10000 - 20000/-		17 (70.83)	20 (66.67)	17 (54.84)	17 (68.00)	15 (68.18)	19 (63.33)	105 (64.81)	0.845
	> 20000/-		3 (12.50)	4 (13.33)	6 (19.35)	4 (16.00)	1 (4.55)	2 (6.67)	20 (12.35)	0.568
Education level of dairy farmers	Illiterate		3 (12.50)	7 (23.33)	9 (29.03)	4 (16.00)	5 (22.73)	8 (26.67)	36 (22.22)	0.689
	Primary		2 (8.33)	3 (10.00)	2 (6.45)	1 (4.00)	3 (13.64)	6 (20.00)	17 (10.49)	0.427
	Middle		4 (16.67)	8 (26.67)	11 (35.48)	9 (36.00)	6 (27.27)	9 (30.00)	47 (29.01)	0.681
	High school		10 (41.67)	8 (26.67)	6 (19.35)	7 (28.00)	6 (27.27)	5 (16.67)	42 (25.93)	0.390
	Graduate		5 (20.83)	4 (13.33)	3 (9.68)	4 (16.00)	2 (9.09)	2 (6.67)	20 (12.35)	0.651
Land holdings per household	Cultivable land	< 1 Acre	3 (12.50)	2 (6.67)	3 (9.68)	3 (12.00)	2 (9.09)	1 (3.33)	14 (8.64)	0.884
		1 – 5 Acre	2 (8.33)	2 (6.67)	1 (3.22)	3 (12.00)	0 (0.00)	0 (0.00)	8 (4.94)	0.275
	Land under orchards	< 1 Acre	7 (29.17)	10 (33.33)	13 (41.94)	5 (20.00)	8 (36.36)	10 (33.33)	53 (32.71)	0.758
		1 – 5 Acre	3 (12.50)	5 (16.67)	4 (12.90)	4 (16.00)	5 (22.73)	4 (13.33)	25 (15.43)	0.930
	Land under mixed cultivation	< 1 Acre	7 (29.17)	7 (23.33)	8 (25.81)	6 (24.00)	5 (22.73)	12 (40.00)	45 (27.78)	0.689
		1 – 5 Acre	2 (8.33)	4 (13.33)	2 (6.45)	4 (16.00)	2 (9.09)	3 (10.00)	17 (10.49)	0.879

Means among tehsils with different lowercase superscripts within a row vary significantly

Figures in parenthesis are percentages of column totals.

fodders being offered to the dairy cattle were also collected from the farmers interviewed, pooled and analysed for proximate composition including Dry Matter (DM), Organic Matter (OM), Crude Protein (CP), Ether Extract (EE), and Non-Structural Carbohydrates (NSC) as per the method described by AOAC (2019).

Statistical analysis: The data was recorded in MS-excel sheets, classified and tabulated. The percentage of parameters were determined as the proportion of observed out of the total surveyed households. The collected data was analysed by using statistical software program SPSS (2011) for determination of means, standard error and test of significance by chi-square test which was referenced for p value for significance. Any p value less than 0.05 ($p<0.05$) was taken to be statistically significant.

RESULTS AND DISCUSSION

Socio-economic profile of dairy farmers: Table 1 presents the socio-economic profile of dairy farmers in district Shopian. No statistically significant differences were observed among the surveyed tehsils for any parameter except for business enterprises as a source of livelihood. Majority (28.40%) of the dairy farmers in the surveyed areas had horticulture as the primary occupation, followed by animal husbandry (22.22%) in which 55.56% were solely involved in dairy-related activities, while only 7.41% of the dairy farmers were practicing agriculture operations. Dairy farmers prefer mixed farming to benefit from multiple income streams, which helps them in cushioning the impact of dairy price fluctuations. Supporting this diversification and offering training in integrated farming techniques can improve their overall resilience. These studies are also aligning with the research of Gadhavi *et al.* (2020) and Sharma *et al.* (2023) who reported that majority of the farmers had agriculture along with dairying as their main occupation. Although business accounts for only 10.49% of the primary occupations among the respondents, but its distribution varied significantly ($p=0.042$) across the surveyed tehsils. The proportion of dairy farmers engaged in business enterprises was higher in Shopian (25.0%) and Imam-sahab (16.67%) compared to Herman (6.45%), Chitragam (4.55%) or Keegam (0.00%) where business as an occupation was minimal or completely absent, representing a limited engagement in non-farm enterprise activities in these areas. This pattern suggested that access to markets, urban proximity, or infrastructural advantages might have facilitated greater diversification into business enterprises in tehsils of Shopian and Imam-sahab, while farmers in the other tehsils remained largely dependent on agriculture and allied activities as their primary livelihood source.

Major proportion (64.81%) of the respondents had medium-income of ₹10,000 – 20,000 per month from dairy farming, followed by 22.84% in the low-income bracket, and a notable 12.35% in the high-income category. This complex economic spectrum among dairy farmers might be attributed to the multifaceted nature of their livelihoods. Income levels of the farmers plausibly reflect their access to markets, productivity, and resource availability. Improvement of income for low-income farmers through different strategies like value addition of products and development of market linkages could help improve their livelihoods. These results were in accordance with the reports of Rajadurai *et al.* (2018).

About 77.78% of the dairy farmers were educated with middle school level of education (29.01%), high school (25.93%) and only 12.35% were graduates. This might be due to lack of higher educational facilities in most of the villages in the district, and also preferential adoption of ancestral horticultural (apple) business by majority of the respondents early in their life. These results are in close agreement with the reports of Shahjar *et al.* (2018). With respect to landholding size, 69.14% of households were small landholders, owning less than one acre, while 30.86% were marginal landholders, holding one to five acres of land. Among small landholders, 32.71%, 27.78%, and 8.64% held land under orchards, mixed cultivation, and cultivable land, respectively, while for marginal landholders, the corresponding values were 15.43%, 10.49%, and 4.94%. Dairy farming was commonly practised on small scale, utilizing marginal land unsuitable for horticulture. Traditional inheritance laws frequently result in sub-division of ancestral land among heirs, which lowers the average size of landholdings over several generations. These findings are in line with the earlier reports of More *et al.* (2020) in Latur district of Maharashtra. Ganai *et al.* (2004) and Ishfaq *et al.* (2017) reported similar irrigated land holding patterns in Srinagar and Budgam districts of Kashmir valley.

Indigenous feeding practices for dairy cattle: Feeding practices followed by dairy farmers in the district are presented in Table 2. Complete intensive feeding system was adopted by the farmers during winter season. Also, in summers, stall-feeding was the predominant feeding system for dairy cattle (84.57%), with significant variation across tehsils ($p=0.003$). It was the principal feeding pattern being followed in Shopian (100.00%) and Imam-sahab (96.67%) tehsils, and remained preferred in the Herman, Zainpora and Chitragam tehsils (72.73 to 88.00%) compared to Keegam (66.67%). Grazing followed an inverse trend, being negligible in the Shopian and Imam-sahab (0.00% and 3.33%) but rising progressively to its highest levels in the Chitragam and Keegam (27.27% and 33.33%, respectively) tehsils. This pattern suggested that stall-feeding dominated probably due to encroachment of common property resources (*gass charai*) leading to limited grazing land availability due to the allocation of land to horticulture, which is the primary occupation of the respondents, that too were often fenced, restricting movements and leaving no open access areas for grazing by livestock. Moreover, greater market integration in most of the tehsils might have promoted stall feeding of livestock rather than reliance on grazing; however, traditional extensive dairy management practices being practiced in

Table 2. Livestock feeding practices adapted by the dairy farmers in district Shopian of Kashmir

Variables			Block Shopian					Block Keller	Dist. ave. (n=162)	p value
			Shopian (n=24)	Imam-sahab (n=30)	Herman (n=31)	Zainpora (n=25)	Chitragam (n=22)	Keegam (n=30)		
Feeding pattern	Winter	Stall	24 (100.0)	30 (100.0)	31 (100.0)	25 (100.0)	22 (100.0)	30 (100.0)	162 (100.00)	1.00
	Summer	Stall	24^{d} (100.0)	29^{d} (96.67)	26^{c} (83.87)	22^{c} (88.00)	16^{b} (72.73)	20^{a} (66.67)	137 (84.57)	0.003
		Grazing	0^{a} (0.00)	1^{a} (3.33)	5^{b} (16.13)	3^{b} (12.00)	6^{c} (27.27)	10^{d} (33.33)	25 (15.43)	0.003
Availability of fodder source	Cultivated		24^{c} (100.0)	30^{c} (100.0)	30^{b} (96.77)	25^{c} (100.0)	20^{b} (90.91)	25^{a} (83.33)	154 (95.06)	0.017
	Natural/Orchard grown		12 (50.00)	15 (50.00)	18 (58.06)	10 (40.00)	15 (68.18)	20 (66.67)	90 (55.56)	0.166
	Tree foliage		1 (4.17)	2 (6.67)	5 (16.13)	2 (8.00)	5 (22.73)	7 (23.33)	22 (13.58)	0.096
Types of roughages used	Winter	Dry only	24 (100.0)	30 (100.0)	31 (100.0)	25 (100.0)	22 (100.0)	30 (100.0)	162 (100.0)	1.000
	Summer	Green only	2 (8.33)	2 (6.67)	6 (19.35)	3 (12.00)	6 (27.27)	8 (26.67)	27 (16.67)	0.167
		Dry + Green	22^{c} (91.67)	28^{c} (93.33)	25^{b} (80.65)	22^{b} (88.00)	16^{a} (72.73)	22^{a} (73.33)	135 (83.33)	0.040
Types of fodder fed	Hay only		19 (79.17)	25 (83.33)	24 (77.42)	21 (84.00)	21 (95.45)	28 (93.33)	138 (85.19)	0.439
	Hay + Silage		5 (20.83)	5 (16.67)	7 (22.58)	4 (16.00)	1 (4.55)	2 (6.67)	24 (14.81)	0.341
Grazing status	Community pastures		2 (8.33)	4 (13.33)	5 (16.13)	3 (12.00)	5 (22.73)	6 (20.00)	25 (15.43)	0.157
	Govt. land (forest)		0 (0.00)	1 (3.33)	3 (9.68)	2 (8.00)	3 (13.64)	4 (13.33)	13 (8.02)	0.157
	Zero grazing		19 (79.17)	23 (76.67)	20 (64.52)	17 (68.00)	11 (50.00)	16 (53.33)	106 (65.43)	0.729
	Orchard grazing		3 (12.50)	2 (6.67)	3 (9.68)	3 (12.00)	3 (13.64)	4 (13.33)	18 (11.11)	0.379
Form in which roughages are fed	Unchaffed		20 (83.33)	27 (90.00)	29 (93.55)	23 (92.00)	22 (100.0)	30 (100.0)	151 (93.21)	0.158
	Chaffed		4 (16.67)	3 (10.00)	2 (6.45)	2 (8.00)	0 (0.00)	0 (0.00)	11 (6.79)	0.961
Practice of concentrate feeding	Yes		22 (91.67)	26 (86.67)	24 (77.42)	23 (92.00)	18 (81.82)	24 (80.00)	137 (84.57)	0.566
	No		2 (8.33)	4 (13.33)	7 (22.58)	2 (8.00)	4 (18.18)	6 (20.00)	25 (15.43)	0.566
Type of concentrate feed offered	Home-made		1 (4.17)	3 (10.00)	6 (19.35)	1 (4.00)	4 (18.18)	7 (23.33)	22 (13.58)	0.170
	Compound feed		21 (87.50)	22 (73.33)	21 (67.74)	20 (80.00)	16 (72.73)	22 (73.33)	122 (75.31)	0.647
	Both		2 (8.33)	5 (16.67)	4 (12.90)	4 (16.00)	2 (9.09)	1 (3.33)	18 (11.11)	0.588
Use of mineral mixture	Yes		22 (91.67)	26 (86.67)	23 (74.19)	23 (92.00)	17 (77.27)	24 (80.00)	135 (83.33)	0.364
	No		2 (8.33)	4 (13.33)	8 (25.81)	2 (8.00)	5 (22.73)	6 (20.00)	27 (16.67)	0.312

Means among tehsils with different lowercase superscripts within a row vary significantly
Figures in parenthesis are percentages of column totals

Chitragam and Keegam probably due to better access to pasture.

Cultivated fodder was the dominant roughage source in the district (95.06%), with significant variation across tehsils (p=0.017). Complete dependence (100.00%) was observed in Shopian, Imam-sahab and Zainpora tehsils, while Keegam tehsil recorded the lowest reliance on cultivated fodder (90.91%) differing significantly from the rest. This fodder availability pattern reflected the predominant stall-feeding system and limited grazing access in the district, while the comparatively lower reliance in the Keegam tehsil aligned with its higher grazing opportunities, as suggested by better access to natural or communal fodder resources. The dominance of cultivated fodder as the major roughage source in the district could also be linked to the socio-economic status of the dairy farmers, as agriculture-based livelihoods especially horticulture enabled them to cultivate sufficient nutritious fodders, ensuring a reliable and quality feed supply. Azeze *et al.* (2024) also reported low adoption of grazing practices by dairy farmers in the highlands of southern Ethiopia.

During winters, animals were exclusively fed dry roughages due to scarcity of green fodder, while in summers, the diet offered included cultivated green fodder or a combination of greens and dry roughages. Combined dry and green roughage was the predominant feeding

practice in the district (83.33%), with significant variation across surveyed tehsils (p=0.040). The adoption of this feeding practice was highest in Shopian and Imam-sahab (91.67% and 93.33%, respectively), and least in Chitragam and Keegam (72.73% and 73.33%, respectively) tehsils, which aligned with their grazing dependence noted earlier. Only 14.81% of the respondents reported usage of silage in diets of dairy cattle in the district which could be attributed to a combination of agro-climatic, socio-economic, and technical factors. Mostly the dairy farmers in Shopian had small herd size (rearing 1-3 animals per household) for whom large-scale silage production was uneconomical. Also, the prevailing temperate climate restricted growing multiple fodder crops per year due to short cropping season. These findings were also supported by the reports of Kumar *et al.* (2019).

Majority (93.21%) of the respondents fed un-chaffed fodders to dairy animals across all studied areas in the district probably due to lack of knowledge about the benefits of chaffing, lack of fodder chaffing equipment, and traditional feeding practices being adopted, reflecting minimal technological awareness among dairy farmers which could be attributed to their low educational status. These findings were in accordance to the reports of Rajadurai *et al.* (2018). Concentrate feeding of dairy animals was practiced by 84.57% of the farmers, of whom 75.31% relied on commercially available compound feeds. Also, 83.3% of the respondents practiced supplementation of mineral mixtures to their dairy animals. The high proportion of respondents supplementing compound feed and/or mineral mixtures to the dairy animals does not necessarily reflect a high level of their awareness, but may instead be attributable to other factors, such as its being a more practical and time-saving solution for meeting the nutritional needs of dairy cattle, recommendations from practicing veterinarians and extension personnel, promotional efforts by feed and supplement dealers, the growing accessibility of ready-made commercial feeds and supplements through dairy cooperatives and government livestock development schemes encouraging the adoption of supplements to dairy animals, irrespective of the farmers' actual understanding of their nutritional significance. These results were in line with Kumar *et al.* (2019) who reported similar results in western Uttar Pradesh. Reshi *et al.* (2021) reported 43.6 % of lactating cows were receiving mineral supplementation in Ganderbal district of Kashmir.

Chemical composition of available feedstuffs: The health and productivity of livestock in a region largely depend on both the quantity as well as quality of the feeds offered to them. The quality of feeds primarily depends on their chemical composition (Nath *et al.* 2023). The chemical composition (on %DM basis) of the feeds and fodders fed to dairy cattle in district Shopian (Table 3) were in normal ranges as prescribed for Indian feeds and fodders (ICAR 2013) with minor variations which might be due to difference in varieties, geographical area, climatic conditions, irrigation, and fertilizer uses. Among roughages, dry matter content was highest in orchard grass hay (92.52%) and lowest in maize fodder (23.40%), while among concentrates, it was highest in linseed oil cake (91.15%) and lowest in rice bran (87.79%). Crude protein (CP) content was highest (15.30%) in lopped tree foliage mix among roughages and in linseed oil cake (30.28%) among concentrates. The CP content of maize

Table 3. Chemical composition of feedstuffs offered to dairy cattle in district Shopian of Kashmir

Feed resource	Dry Matter	Organic Matter	Crude Protein	Ether Extract	Non-Structural Carbohydrates
Paddy straw (n= 11)	89.67±0.18	79.86±0.37	3.03±0.02	1.17±0.01	33.13±0.40
Oat straw (n= 34)	91.69±0.13	92.96±0.24	3.55±0.02	0.86±0.01	52.53±0.37
Maize stover (n=116)	86.97±0.15	89.33±0.29	3.70±0.02	0.78±0.01	38.24±0.57
Sorghum stover (n= 23)	88.45±0.20	87.71±0.30	5.20±0.04	1.06±0.02	36.99±0.48
Orchard grass hay (n=115)	92.52±0.14	86.23±0.36	8.77±0.05	2.56±0.07	42.06±0.68
Lopped dry tree foliage mix (n= 28)	91.99±0.08	83.14±0.17	12.14±0.06	3.48±0.05	31.03±0.57
Oats fodder (n=14)	37.83±0.30	91.43±0.08	4.92±0.04	1.75±0.02	61.43±0.38
Maize fodder (n=52)	23.40±0.32	87.53±0.19	6.17±0.05	0.91±0.02	50.60±0.48
Orchard grass (n= 144)	27.12±0.46	85.88±0.29	12.24±0.07	1.92±0.04	51.00±0.56
Lopped tree foliage mix (n=6)	29.69±0.88	82.52±0.45	15.30±0.22	2.68±0.08	39.42±0.84
Maize grains (n= 55)	89.96±0.22	97.48±0.20	8.03±0.06	4.18±0.01	83.08±0.23
Rice bran (n= 4)	87.79±0.21	92.92±0.17	12.41±0.18	8.17±0.05	55.59±0.46
De-oiled rice bran (n= 19)	89.01±0.07	86.21±0.37	14.64±0.04	1.46±0.02	52.07±0.11
Wheat bran (n= 57)	89.36±0.32	91.78±0.42	13.21±0.21	2.23±0.05	61.25±0.75
Mustard oilcake (n= 30)	89.33±0.46	92.77±0.30	28.16±0.31	7.32±0.15	47.16±0.65
Linseed oilcake (n= 21)	91.15±0.47	91.88±0.29	30.28±0.52	6.57±0.19	46.98±0.70
Home-made concentrate (n=17)	91.14±0.39	91.58±0.28	14.35±0.48	2.35±0.08	68.21±0.76
Commercial compound feed (n= 95)	90.83±0.18	90.36±0.16	15.61±0.14	2.27±0.01	65.00±0.21

fodder analysed in the present study was in accordance with the findings of Hanif *et al.* (2020). Among roughages, ether extract and non-structural carbohydrates content was highest in lopped dry tree foliage mix (3.48%) and oats fodder (61.43%) while among concentrates, it was highest in rice bran (8.17%) and maize grains (83.08%). These results were in close agreement with the findings of Bhat *et al.* (2021) and Sheikh *et al.* (2022) pertaining to composition of feedstuffs available in different districts of Kashmir.

Dairy farmers in Shopian had a mixed livelihood system, with horticulture as the primary and dairying as a supplementary income source. Most of the farmers had small landholdings, limited cultivable land, and middle school education. Traditional livestock feeding practices were shaped by seasonal and resource constraints wherein stall feeding in winters, semi-stall with limited grazing was carried in summers. Low silage use and feeding of un-chaffed fodders depicted farmers un-awareness. Reliance on commercial compound feeds, and widespread mineral supplementation were common under external influences. Feed composition met nutritional standards, supporting basic livestock health. These insights can help in framing policies and interventions for sustainable growth of dairy sector in the region.

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