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### Socio-economic determinants of cattle feed adoption among dairy farmers in Raipur district of Chhattisgarh

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#### Abstract

Dairy farming was a major livelihood source in Raipur district, Chhattisgarh, but traditional feeding methods dominated. This study surveyed 100 farmers to examine feeding practices, consumption patterns, and awareness of balanced nutrition. Findings showed reliance on green (80%) and dry fodder (72%), with cost (76%) and availability (68%) as key determinants. Only 20% were highly aware of scientific feeding. The study concluded that promoting balanced nutrition, improving feed access, and strengthening extension services were essential to enhance productivity and sustainable livelihoods.

**Keywords:** Cattle feed, dairy farmers, feed consumption patterns, Raipur district, Chhattisgarh, feeding practices

#### Introduction

Half of India's population lives in rural regions and relies on the dairy industry as a secondary source of income; 30% of this population lives in poverty (Doupbrate *et al.* 2013) <sup>[4]</sup>. Enhanced nutrition accounts for around two-thirds of the productivity gains in many cattle production systems. In India, dairy farming would not be possible without cattle. Cattle are widely raised in India for their meat, milk, and other products on both big and small farms. It is essential to implement innovative dairy farming methods, increase the cow number, and implement effective management procedures (Nimbalkar, V. 2021) <sup>[10]</sup>. Cattle raising as a practice in India predates the country's agricultural sector. Notably, in developing nations, livestock-derived milk and meat production has transitioned from constituting merely 31% and 22% of global output in 1973 to a substantial 63% and 53% share by 2013. The contribution of livestock products to the agricultural sector's value is poised to continue its upward trajectory, fueled by the relentless growth in demand for animal-based foods, driven by increasing affluence and population expansion (Kappes *et al.* 2023) <sup>[6]</sup>.

Livestock products like milk, curd, cheese, butter not only provide steady income but also essential nutrients, enhancing the health and well-being of farming households. The use of livestock manure as organic fertilizer supports soil fertility and sustainable farming practices. Moreover, the sector creates employment opportunities in various

livestock management activities and acts as collateral for accessing credit, thereby playing a pivotal role in bolstering the rural economy (D M *et al.* 2023) <sup>[5]</sup>.

The animal feed industry serves as the primary driver of livestock production, constituting up to 70% of total operational costs. Its close association with the safety and quality of the food chain underscores the importance of providing balanced and high-quality feed to animals, as inadequate nutrition can adversely affect their production, health and welfare. Moreover, the production, processing and transportation of feed contribute significantly to greenhouse gas emissions, accounting for 45% of emissions from the livestock sector (Makkar 2018) <sup>[9]</sup>.

The animal feed industry in India stands as one of the world's largest producers, with the Indian market reaching INR 1,035.2 Billion in 2023. Forecasts indicate a projected growth at a compound annual rate of 7.2% from 2024 to 2032, expecting to reach INR 1,964.8 Billion by 2032. The commonly used animal feeds comprise pasture grasses, cereal grains, hay and silage crops (Kumar *et al.* 2021) <sup>[7]</sup>.

Cattle were utilised as draft animals when humans eventually got down to farming. Because of the scarcity of high-quality feed and the prevalence of inhumane feeding methods, livestock husbandry in India is largely dependent on the economic and social circumstances of individual farmers. Many rural families, especially those headed by tiny, marginal, or landless farmers, rely on revenue supplements from animal husbandry and dairy development.

In semi-urban areas and drought-prone regions, it offers a supplementary source of income for families whose crops may not be enough to cover their needs. There are 535.78 million cattle, buffalo, sheep, goats, pigs, horses, mules, donkeys, camels, Mithun, and yaks in the nation, as reported in the 20<sup>th</sup> Livestock census (2019). As a country, India has the largest livestock population, accounting for over 17.64% of the global total. Additionally, it is home to 302.72 million bovines. Out of the total 192.49 million cattle in India, 50.43 million are exotic or crossbred. There are 142.11 million indigenous and nondescript cattle in the nation, and 109.85 million buffalo.

Smallholder farmers may benefit from a number of other qualities, even if cross-bred dairy cows are mostly kept for their exceptional milk production (Bebe *et al.* 2003) [3]. Dairy cows and cattle in general provide the farm with excrement, calves, and culled animals for sale in addition to milk. Additionally, they serve as a buffer against unanticipated circumstances and are seen as a status symbol (Karanja 2018) [8]. Contrary to other livestock development plans and assessments that primarily concentrate on biological productivity for immediate milk or meat production, the viewpoints and goals of livestock producers clash with this more comprehensive approach (Sumberg 2012) [11].

Chhattisgarh has a significant livestock population with a focus on cattle, buffaloes, goats sheep and poultry here's an approximate breakdown of livestock population in the state. Cattle around 8 million, buffaloes about 3.5 million, goats over 7 million, sheep around 1 million, Poultry- poultry farming is also widespread with several million birds raised for eggs and meat. Over 70 percent of the rural household have own livestock and earn supplementary income. Dairy sector is one of the extremely livelihood support to the rural of Chhattisgarh state. The population of milch animal in Chhattisgarh state is 10.08 million but the milk production is 1.12 million metric tons with per capita availability of state is 152 gm/day. The contribution of Chhattisgarh to the national milk production is only 0.87 percent (Department of Animal Husbandry, 2019).

## Materials and Methods

### Research design

The study followed a quantitative research design, where 100 dairy farmers from Raipur district, Chhattisgarh were selected using simple random sampling. Data were collected through a structured questionnaire contained open-ended and Likert-scale questions to capture information on feeding practices, awareness of balanced nutrition, and factors influenced feed selection.

### Study area

Dairying was a significant source of income for many rural people in the Raipur area of Chhattisgarh, where author conducted this research. Because of its varied cattle-rearing culture, plenty of agricultural leftovers, and reliance

on both modern and traditional feeding methods, the Raipur area was an ideal location for the study.

**Sample Size:** 100 dairy farmers from the Raipur district in Chhattisgarh were a part of this research. Cattle feed consumption patterns and feeding methods in the Raipur area were studied using a sample that spanned a range of herd sizes and socio-economic variables.

### Data collection method

The study relied on a questionnaire that was specifically designed to gather data from dairy farmers in the Raipur region of Chhattisgarh, since it was a quantitative research method. To gather information from the dairy farmers in the Raipur area of Chhattisgarh, a structured questionnaire was created. The structured questionnaire assessed the following: farmer awareness levels, feeding practices, and cattle feed consumption pattern; answers were scored on a 5-point Likert scale. The questions were both open-ended and scale based. The use of a structured questionnaire ensured that all respondents gave the same answer, which allowed for more accurate statistical analysis and led to plausible findings about the farmers' perceptions of the aspects they considered when choosing cow feed and the correlation between feed quality and milk production.

### Statistical tools

Two statistical tools, SPSS and MS Excel, were used in the investigation. In order to analyse eating habits and the variables that impacted them, SPSS was utilised for systematic data analysis. This study made use of descriptive and inferential statistics. The data was presented effectively using MS Excel. By using charts, tables, and graphs, we were able to eliminate confusion and boost visualisation.

## Results and Discussion

The demographic profile of respondents presented in Table 1 revealed that out of 100 participants, the majority were male (70%) while females constituted 30%, indicating male dominance in dairy farming in the study area. Age distribution showed that 25% were young (20–35 years), 50% belonged to the middle-aged group (36–50 years), and 25% were older than 50 years, suggesting that dairy farming was primarily carried out by the economically active middle-aged group. In terms of education, 20% of the respondents were illiterate, 50% had completed primary to secondary education, and 30% had higher secondary or above, reflecting a moderate literacy level among the farming community. Herd size analysis indicated that 36% maintained small herds (1–5 cattle), 40% had medium herds (6–10 cattle), and 24% possessed large herds (>10 cattle), showing the predominance of smallholders. With regard to income sources, 56% of the farmers relied mainly on dairy farming, while 44% combined agriculture with dairy, highlighting the dual livelihood strategy practiced in the region.

**Table 1:** Demographic Profile of Respondents

Parameter	Category	Frequency	Percentage (%)
Gender	Male	70	70.0
	Female	30	30.0
Age Distribution	Young (20–35)	25	25.0
	Middle (36–50)	50	50.0
	Old (>50)	25	25.0
Education Level	Illiterate	20	20.0
	Primary–Secondary	50	50.0
	Higher Secondary+	30	30.0
Herd Size	Small (1–5)	36	40.0
	Medium (6–10)	40	36.0
	Large (>10)	24	24.0
Primary Source of Income	Dairy	56	56.0
	Agriculture + Dairy	44	44.0

In table 2, 72% of dairy producers surveyed said they preferred green grass over other types of cow feed. Additionally, 80% of respondents said they liked and utilized dry feed made from straw and husk. 65% of farmers utilized concentrates (bran and oil cakes), indicating a modest level of understanding about nutritional supplementation. The minimal use of commercial packaged feed (i.e., feed with a guaranteed analysis; 25%) and mineral mixes, or supplements (30%) further suggested that few dairy producers were familiar with or could afford contemporary, sophisticated, and scientifically established feeding procedures. The use of scientifically sophisticated feeding techniques is still in its infancy in the Raipur area, despite the data showing that traditional feed methods are still important.

**Table 2:** Types of Cattle Feed Used by Farmers

Feed Type	Farmers Using (%)
Green Fodder	72
Dry Fodder (straw, husk)	80
Concentrates (oil cakes, bran)	65
Mineral Mixture/Supplements	30
Commercial Packaged Feed	25

The results presented in Table 3 Factors Influencing Feed Selection indicated that the most important factor considered by farmers was cost, reported by 76 percent of respondents, followed by availability at 68 percent, while 56 percent emphasized nutritional value as a key determinant. Traditional practices influenced 44 percent of farmers, reflecting the continued reliance on customary methods, whereas only 20 percent considered advice from experts, showing limited dependence on formal guidance. This suggested that economic considerations and accessibility dominated feed selection decisions among dairy farmers, while scientific or expert-based inputs played a relatively minor role.

**Table 3:** Factors Influencing Feed Selection

Factor	Frequency (No. of Farmers)	Percentage (%)
Cost	76	76.0
Availability	68	68.0
Nutritional Value	56	56.0
Traditional Practices	44	44.0
Advice from Experts	20	20.0

The findings in Table 4 Awareness of Balanced Nutrition and Scientific Feeding showed that only 20 percent of respondents had high awareness and followed scientific feeding practices while 36 percent displayed moderate awareness with partial adoption and the largest share 44 percent reported low awareness indicating that most farmers lacked adequate knowledge about balanced nutrition. This pattern highlights a critical knowledge gap suggesting that despite the importance of balanced feeding for improving cattle health and milk productivity the majority of dairy farmers in the study area continued to depend on traditional methods rather than adopting scientific feeding practices.

**Table 4:** Awareness of Balanced Nutrition and Scientific Feeding

Awareness Level	Frequency (No. of Farmers)	Percentage (%)
High (aware, follows practices)	20	20.0
Moderate (partial awareness)	36	36.0
Low (little to no awareness)	44	44.0
Total	100	100.0

## Conclusion

This study in Raipur district highlighted that most small and medium dairy farmers relied on green and dry fodder, with little use of concentrates or supplements. Feed price and availability were the main factors that influenced choices, while awareness of balanced and scientific feeding was low. The findings stressed the need for training, affordable feed options, and extension services to improve milk productivity, herd health, and the sustainability of dairy farming in rural Chhattisgarh.

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