

KNOWLEDGE OF DAIRY FARMERS ABOUT SCIENTIFIC REARING PRACTICES OF CALVES

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ABSTRACT

In the changing global economic scenario, Indian dairy farmers need to improve productivity and efficiency, which largely depends on their knowledge of scientific animal husbandry practices. Knowledge is a prerequisite for adoption of improved technologies, particularly scientific calf rearing, which determines the future productivity of dairy animals. Keeping this in view, the present study was conducted in Banaskantha district of Gujarat to assess the knowledge level of dairy farmers regarding scientific rearing practices of calves and to examine its relationship with their profile characteristics. The study was carried out on 300 dairy farmers selected through random sampling, following an ex-post facto research design. The results revealed that the majority (65.33 per cent) of dairy farmers possessed a medium level of overall knowledge about scientific rearing practices of calves, followed by low (21.67 per cent) and very low (7.67 per cent) levels, while only a small proportion had high to very high knowledge. Correlation analysis showed that education, land holding, herd size, annual income, social participation, extension participation, mass media exposure, personal training received, scientific orientation and economic motivation were positively and significantly associated with knowledge level. Age and experience in dairy farming had negative but significant association, whereas family size and innovative proneness showed non-significant relationship. The study emphasizes strengthening education, training and extension services to enhance knowledge and adoption of scientific calf rearing practices, thereby improving productivity and income of dairy farmers.

Keywords: dairy farmers, knowledge level, scientific calf rearing

INTRODUCTION

India is predominantly an agrarian country, with agriculture and allied sectors forming the backbone of rural livelihoods. According to the Census of India (2011), about 54.6 per cent of the population depends on agriculture and allied activities, while the Economic Survey (2023) reports that these sectors contribute 18.3 per cent to the national GDP. Animal husbandry alone accounts for nearly 25.6 per cent of agricultural GDP and about 4.11 per cent of the total GDP, highlighting its crucial role in the rural economy. Livestock not only supports farm income but also promotes industrial development through dairy, feed, and leather industries, helps mitigate risks associated with crop failure, enhances food and nutritional security through milk and meat, and contributes to environmental sustainability via biogas and manure production. Around 70 million rural households own livestock, mostly small and marginal farmers, for whom both household-based and commercial dairy units provide viable avenues for sustainable development and self-employment. As per the 20th Livestock Census (2019), India possesses 535.8 million livestock, including 302.3 million bovines,

ranking first globally in cattle and buffalo population, milk production (20.17% of global share) and buffalo meat export, and third in egg production. Despite these achievements, productivity per animal remains low due to inadequate management, poor nutrition, limited veterinary services and suboptimal health care (Mahammad et al., 2022). Scientific calf rearing is a key intervention to address low productivity, as it determines future growth, health, farm sustainability and conservation of germplasm. The neonatal period is particularly critical, involving physiological, metabolic and immunological transitions that make calves highly vulnerable to stress and disease (Davis and Drackley, 1998). Poor calf health and mortality cause significant economic losses, with mortality rates reported to exceed 50 per cent in early life stages (Bilal et al., 2009). Effective calf management therefore requires adequate knowledge about proper nutrition, hygienic environments and strong extension linkages between researchers and farmers to ensure adoption of scientifically proven practices (Maousami et al., 2014; Mahammad et al., 2021). Therefore, the present study was undertaken to find the knowledge level of dairy farmers regarding scientific

rearing practices of calves in Banaskantha district of Gujarat.

OBJECTIVES

- (1) To know the knowledge level of dairy farmers about scientific rearing practices of calves
- (2) To find out relationship between the personal profile of dairy farmers and their level of knowledge about scientific rearing practices of calves

METHODOLOGY

The present study was undertaken in Banaskantha district of north Gujarat. Banaskantha district possesses fourteen talukas namely – Amirgadh, Bhabhar, Danta, Dantiwada, Deesa, Dhanera, Deodar, Kankrej, Lakhani, Palanpur, Suigam, Tharad, Vadgam and Vav. Out of fourteen talukas in the district, six talukas were randomly selected. From each selected taluka, five villages having functional milk producer's co-operative societies were selected randomly and around ten dairy farmers from each village were selected randomly. Thus, total 300 dairy farmers were selected as sample for present study. “Ex-post facto design” was employed in the present investigation as the events have already occurred and design was considered appropriate (Kerlinger, 1976). The data were collected through direct personal investigation with help of well-defined interview schedule. The statistical parameters included were frequency, percentage and co-efficient of correlation.

RESULTS AND DISCUSSION

Knowledge level of dairy farmers about scientific rearing practices of calves

Knowledge refers to the understanding of scientific calf-rearing practices possessed by dairy farmers and reflects their cognitive behavior developed through learning. Such knowledge brings changes in thinking patterns and helps farmers make informed and practical decisions. Therefore, the present study attempted to assess the overall level of knowledge of dairy farmers regarding various aspects of scientific rearing practices of calves.

It was assured by asking various questions related to scientific rearing practices of calves. The questions were framed on different dimensions of scientific rearing practices of calves. The answer given by dairy farmers was noted in the interview schedule, then “one” mark was assigned for every right answer and “zero” marks were assigned for every wrong answer. A total sum of score was calculated and knowledge index was obtained from result. On the basis of score obtained by dairy farmers categorized into five groups as shown in Table 1.

Table 1: Dairy farmers according to their level of knowledge about scientific rearing practices of calves (n=300)

Sr. No.	Category	Frequency	Per cent
1	Very low (Up to 20.0 per cent)	23	7.67
2	Low (20.01 to 40.0 per cent)	65	21.67
3	Medium (40.01 to 60.0 per cent)	196	65.33
4	High (60.01 to 80.0 per cent)	10	3.33
5	Very high (Above 80.0 per cent)	06	2.0

Almost two-third of (65.33 per cent) of the dairy farmers had medium level of knowledge about scientific rearing practices of calves, followed by 21.67 and 7.67 per cent of dairy farmers had low level of knowledge about scientific rearing practices of calves, respectively. While, 3.33 and 2.0 per cent of dairy farmers had high and very high level of knowledge about scientific rearing practices of calves, respectively.

From the above findings it may be concluded that vast majority of dairy farmers had medium to low level of knowledge about scientific rearing practices of calves. It might be due to overwhelming majority of dairy farmers had very low level of personal training received, mass media exposure and extension participation. A similar result was found by Singh *et al.* (2018), Gunaseelan *et al.* (2018), Mariammal *et al.* (2018), Kapadiya *et al.* (2022) and Karthik *et al.* (2022).

Relationship between the profile of dairy farmers and their level of knowledge about scientific rearing practices of calves

It has been attempted to assure the relationship between personal, social, economic, communicational and psychological characteristics of dairy farmers with their level of knowledge about scientific rearing practices of calves. Obtained data are presented in Table 2.

To determine the correlation between the level of knowledge and the profile of dairy farmers, the *r* value was calculated with the help of the Karl Pearson method. Age of dairy farmers had negative and highly significant correlation with their level of knowledge about scientific rearing practices of calves. A similar result was found by Sheikh *et al.* (2017), Bagul (2018) and Dabhi *et al.* (2019) and in contrary to Triveni (2016) and Barasara *et al.* (2023).

Education of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. The findings are in line with the results found by Sheikh *et al.* (2017), Bagul (2018),

Table 2: Relationship between characteristics of dairy farmers and their level of knowledge about scientific rearing practices of calves

(n=300)

Sr. No.	Characteristics	Correlation Coefficient ('r' value)
X ₁	Age	-0.270**
X ₂	Education	0.769**
X ₃	Experience in dairy farming	-0.324**
X ₄	Family size	-0.020 ^{NS}
X ₅	Land holding	0.199**
X ₆	Herd size	0.177**
X ₇	Annual income	0.219**
X ₈	Social participation	0.241**
X ₉	Extension participation	0.559**
X ₁₀	Mass media exposure	0.607**
X ₁₁	Personal training received	0.293**
X ₁₂	Scientific orientation	0.516**
X ₁₃	Innovative proneness	-0.02 ^{NS}
X ₁₄	Economic motivation	0.718**

NS – Non-significant

*correlation is significant at the 0.05 level (2 tailed)

** correlation is significant at the 0.01 level (2 tailed)

Dabhi *et al.* (2019), Swami *et al.* (2024) and Chaudhary *et al.* (2024) and in contrary to Triveni (2016) and Barasara *et al.* (2023).

Experience in dairy farming of dairy farmers had negative and highly significant correlation with their level of knowledge about scientific rearing practices of calves. The findings are in contrary to the results found by Rahman & Gupta (2015), Triveni (2016), Bagul (2018), Dabhi *et al.* (2019) and Barasara *et al.* (2023).

Family size of dairy farmers had negative and non-significant correlation with their level of knowledge about scientific rearing practices of calves. Thus, it was observed that family size had no significant relationship with the level of knowledge of dairy farmers regarding scientific rearing practices of calves, as no meaningful correlation was found. The results indicated that dairy farmers possessed similar levels of knowledge irrespective of their family size. A similar result was found by Barasara *et al.* (2023).

Land holding of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. This result indicates that the knowledge level of dairy farmers about scientific rearing practices of calves increase with the increase in land holding of dairy farmers. The findings are in accordance with the

results found by Triveni (2016), Sheikh *et al.* (2017), Kaur *et al.* (2017), Bagul (2018), Barasara *et al.* (2023), Swami *et al.* (2024) and Chaudhary *et al.* (2024)

Herd size of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. The findings are in accordance with the result found by Triveni (2016), Kaur *et al.* (2017), Dabhi *et al.* (2019) and Swami *et al.* (2024) and in contrary with the findings of Sheikh *et al.* (2017) and Barasara *et al.* (2023).

Annual income of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. The results revealed that dairy farmers with higher annual income had a greater level of knowledge about scientific rearing practices of calves compared to those with lower income. Higher income enables farmers to invest more in scientific calf rearing, encouraging knowledge acquisition and rational decision-making. Thus, annual income was found to be an important factor influencing the level of knowledge regarding scientific rearing practices of calves. A similar result was found by Thakkar (2013), Triveni (2016), Bagul (2018), Dabhi *et al.* (2019), Barasara *et al.* (2023) and Chaudhary *et al.* (2024).

Social participation of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. Membership or holding positions in different institutions and organizations enabled farmers to access a wider range of information, leading to improved knowledge with higher social participation. These results are in accordance with the results found by Dabhi *et al.* (2019), Barasara *et al.* (2023) and Chaudhary *et al.* (2024) and in contrary with the results found by Thakkar (2013) and Sheikh *et al.* (2017).

Extension participation of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. Participation in extension activities provided opportunities for organized interaction, leading to increased knowledge of scientific calf-rearing practices. The results are in accordance with the result found by Sheikh *et al.* (2017), Bagul (2018) and Dabhi *et al.* (2019) and in contrary to the result found by Thakkar (2013) and Barasara *et al.* (2023).

Mass media exposure of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. Various mass media such as television, radio, newspapers, and farm magazines helped create awareness on different aspects of scientific calf rearing, which stimulated curiosity

and enhanced knowledge among farmers with higher media exposure. The results are in accordance with the result found by Sheikh *et al.* (2017), Bagul (2018), Dabhi *et al.* (2019) and Chaudhary *et al.* (2024) and in contrary to the result found by Thakkar (2013).

Personal training received by dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. Generally, participation of dairy farmers in training programmes helps reorient their understanding, leading to a favourable attitude toward acquiring more information and enhancing their knowledge of scientific rearing practices of calves. Thus, personal training emerged as a key factor in improving the knowledge level of dairy farmers regarding scientific calf rearing. The results are in accordance with the result found by Rahman & Gupta (2015), Bagul (2018), Dabhi *et al.* (2019) and Chaudhary *et al.* (2024).

Scientific orientation of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. Scientific orientation builds trust in using scientific methods, increases confidence, and supports better decision-making in calf rearing. This confidence promotes wider adoption of scientific practices, resulting in higher knowledge levels among dairy farmers with greater scientific orientation. The results are in accordance with the result found Thakkar (2013), Triveni *et al.* (2018) and Bagul (2018).

Innovative proneness of dairy farmers had negative and non-significant correlation with their level of knowledge about scientific rearing practices of calves. This result indicates that knowledge of dairy farmers about scientific rearing practices of calves was similar irrespective of their innovative proneness and had no role to play in determination of knowledge level among the dairy farmers about scientific rearing practices of calves. The results are in accordance with the result found by Dabhi *et al.* (2019) and in contrary to the result found by Thakkar (2013) and Triveni (2016).

Economic motivation of dairy farmers had positive and highly significant correlation with their level of knowledge about scientific rearing practices of calves. From the findings, it can be concluded that economic motivation of dairy farmers played an important role in determining their level of knowledge about scientific rearing practices of calves. Higher economic motivation encourages profit-oriented and rational thinking, which drives farmers toward improved calf rearing practices and enhances their knowledge of scientific rearing methods. The results are in accordance with the result found by Triveni (2016), Sheika *et al.* (2017), Bagul (2018), Dabhi *et al.* (2019); Chaudhary *et al.* (2024);

Patel *et al.* (2025); Peer (2025); Rajput *et al.* (2025); Patel *et al.* (2025); Yadav *et al.* (2025) and in contrary to the result found by Thakkar (2013).

CONCLUSION

It can be concluded that the dairy farmers had predominantly medium to low level of knowledge about scientific rearing practices of calves. A majority of the respondents possessed a medium level of knowledge, while only a small proportion exhibited high to very high knowledge, indicating considerable scope for improvement. The moderate knowledge status may be attributed to limited personal training received, lower mass media exposure and inadequate extension participation among most dairy farmers. The analysis of relationship revealed that out of fourteen independent variables, ten variables viz., education, land holding, herd size, annual income, social participation, extension participation, mass media exposure, personal training received, scientific orientation and economic motivation showed positive and highly significant association with knowledge level, whereas age and experience in dairy farming exhibited negative but significant relationship. Family size and innovative proneness showed non-significant association with knowledge level. Overall, the findings suggest that strengthening education, training programmes, extension services and effective use of mass media can substantially enhance the knowledge of dairy farmers regarding scientific calf rearing practices. Improved knowledge is expected to promote better adoption of scientific practices, leading to higher productivity, reduced calf mortality and increased income from dairy farming.

RECOMMENDATION

Capacity building programmes should be strengthened through regular training, demonstrations, and extension activities to improve farmers' knowledge of scientific calf rearing practices.

Use of mass media and institutional linkages should be enhanced to effectively disseminate scientific information and increase awareness among dairy farmers.

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

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