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Transforming dairy entrepreneurship: Impact of Pashu-Vigyan incubator training on income and employment generation

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Abstract

Entrepreneurship development in dairying has emerged as an important strategy for promoting self-employment, income generation and livelihood security among rural youth and farmers. The present study was conducted to assess the effectiveness of the Dairy Farming and Milk Processing Entrepreneurship Development Programme organized by IVRI-Pashu-Vigyan Incubator, ICAR-Indian Veterinary Research Institute, Izatnagar. An ex-post facto research design was adopted as the training programmes had already been conducted. Out of 140 trainees who attended four training programmes during 2019-20 and 2020-21, 91 respondents constituted the final sample through mailed questionnaire and telephonic follow-up. Among them, 81 respondents maintained dairy animals and 32 had initiated new dairy enterprises after training. Data were collected on socio-economic profile, communication behavior, entrepreneurial behavior, knowledge, attitude, adoption, income generation, employment generation and constraints. The results revealed that majority of respondents had medium level of entrepreneurial behavior, knowledge and adoption, while most possessed favourable attitude towards scientific dairy farming. The mean annual income of new dairy entrepreneurs increased from Rs. 5,83,750 before training to Rs. 21,53,229 after training, while annual employment generation increased from 144.00 to 434.15 man-days. Entrepreneurial behavior, social participation, knowledge and attitude were positively associated with income and employment generation. Major constraints included non-availability of credit, high capital investment, lack of awareness about government schemes, low and irregular milk payment, weak market linkage and lack of practical exposure in online training. The study concludes that Pashu-Vigyan Incubator played an important role in promoting dairy entrepreneurship, but future programmes should be strengthened through practical demonstrations, credit linkage, market support and systematic post-training handholding.

Keywords: Dairy entrepreneurship, entrepreneurship development, Pashu-Vigyan incubator, scientific dairy farming, income generation, employment generation

Introduction

India is primarily an agriculture-based country, where agriculture and allied sectors support the livelihood of a large proportion of the population. Livestock is one of the most important sub-sectors of agriculture and contributes significantly to rural income, employment, food security and nutritional security (Indian Agriculture and Allied Industries Industry Report, 2026) [8]. During 2024-25, agriculture and allied sectors accounted for about 18.0 percent of India's GDP, while the livestock sector contributed around 5.5 percent to national GVA and 31.0 percent to agricultural GVA in 2023-24. (Economic Survey, 2024-25; DAHD Annual Report, 2024-25) [6].

Livestock has a special role in the rural economy because it provides regular income and employment, particularly to small, marginal and landless households. It also acts as an economic buffer during crop failure and other uncertainties. Among livestock enterprises, dairy farming is one of the most promising livelihood options because it provides regular cash flow, requires comparatively less land and supports year-round employment (Khode, 2018) [15, 16]. Dairying also contributes to poverty reduction, food security, women's participation and nutritional improvement, thereby supporting several Sustainable Development Goals (Parida *et al.*, 2020) [19].

India has transformed from a milk-deficit country to the largest milk producer in the world. The establishment of the National Dairy Development Board and implementation of Operation Flood played a major role in this transformation (FICCI, 2020). As per the 21st Livestock Census, India possesses 536.76 million livestock, including 193.46 million cattle and 109.85 million buffaloes (DAHD, 2025) [6]. Despite this progress, low productivity per animal, poor management, feed and fodder scarcity, weak adoption of scientific dairy practices and poor hygiene remain major challenges in Indian dairying (Patil *et al.*, 2009) [20].

Entrepreneurship Development Programmes (EDPs) can play a significant role in addressing these challenges by converting technically trained individuals into enterprise owners. Under RKVY-RAFTAAR, Agri-Business Incubation Centres (ABICs) have been strengthened to promote agripreneurship and agri-business in agriculture and allied sectors. The IVRI-Pashu-Vigyan Incubator at ICAR-IVRI, Izatnagar has been promoting entrepreneurship in various livestock-based sectors, including dairy farming and milk processing (Singh *et al.*, 2020) [22].

However, the success of any EDP cannot be judged merely by the number of trainings conducted. It must be assessed in terms of enterprise establishment, scientific knowledge, attitude, adoption, income generation, employment generation and constraints faced by trainees after completion of the programme. Therefore, the present study was undertaken to assess the effectiveness of the Dairy Farming and Milk Processing Entrepreneurship Development Programme organized by IVRI-Pashu-Vigyan Incubator.

Methodology

The Study was conducted in the Division of Extension Education, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh. An ex-post facto research design was used because the Dairy Farming and Milk Processing Entrepreneurship Development Programmes had already been conducted and the variables under study could not be manipulated.

The respondents were selected from trainees who attended Dairy Farming and Milk Processing EDPs organized by IVRI-Pashu-Vigyan Incubator during 2019-20 and 2020-21. A total of 140 trainees participated in four training programmes. The questionnaire was mailed to all trainees and telephonic follow-up was carried out. Finally, 91 trainees who returned the duly filled questionnaire and provided complete information were selected as respondents. Out of these, 81 respondents maintained dairy animals, while 10 did not own dairy animals. Among the 81 dairy-animal owners, 32 respondents had initiated new dairy enterprises after training and 49 continued with their already existing dairy units.

Entrepreneurial behavior was measured through nine components using the scale developed by Chaudhary *et al.* (2007) [4] with suitable modification. Knowledge level regarding scientific dairy farming practices was assessed using the scale developed by Biswas *et al.* (2015) [3]. Attitude towards scientific dairy farming was measured using the scale developed by Gautam *et al.* (2014) [11]. Adoption was operationalized as the extent to which respondents used recommended scientific dairy practices, based on the concept of Rogers and Shoemaker (1971) [21]. Income generation was recorded as annual income from

dairy enterprise. Employment generation was calculated in man-days by converting working time into eight-hour workdays. Constraints were ranked using Garrett ranking technique. Data were analyzed using frequency, percentage, mean, standard error, correlation and paired t-test.

Results and Discussion

Socio-economic profile and enterprise establishment

The mean age of respondents was 34.49 years, indicating that the Dairy Farming and Milk Processing EDP attracted a largely young group of trainees. This is important because youth-oriented dairy entrepreneurship can contribute to self-employment and livelihood security. Out of 91 respondents, 81 maintained dairy animals. Among them, 32 respondents had started new dairy enterprises after attending the training programme, while 49 continued with already existing dairy units. This indicates that the programme motivated a substantial proportion of trainees to initiate dairy-based enterprises.

The training programmes were attended by participants from different states and union territories, with a higher proportion from Uttar Pradesh. Both online and offline modes contributed to participation; however, online training enabled broader geographical reach. The establishment of new dairy enterprises after training indicates that the EDP had practical relevance in motivating trainees towards livestock-based entrepreneurship.

Utilization of communication sources

Respondents used informal sources, extension agencies and mass media for obtaining dairy-related information. Family members, friends, private veterinarians and local para-veterinarians were important informal sources. Extension agencies such as livestock development officers, cooperative personnel and subject matter specialists also contributed to dairy-related information flow.

Mobile phones and internet/social media were among the most frequently used sources of information. This indicates the increasing role of digital media in livestock advisory services. Similar importance of modern information and communication technologies among farmers was reported by Mittal and Mehar (2016) [18]. Therefore, digital follow-up through WhatsApp groups, mobile-based advisories, short training videos and online consultation may be useful for strengthening post-training support.

Entrepreneurial behavior of trainees

Entrepreneurial behavior was assessed through nine dimensions: self-confidence, cosmopolitaness, decision-making ability, innovativeness, risk orientation, coordinating ability, information-seeking behavior, planning ability and achievement motivation. Majority of respondents had medium level of entrepreneurial behavior (65.43%), followed by low (18.52%) and high (16.05%) levels. The mean Entrepreneurial Behavior Index was 57.49 ± 1.30 . This shows that most trainees possessed moderate entrepreneurial orientation after attending the EDP. Similar medium level of entrepreneurial behavior among dairy farmers was reported by Ahuja *et al.* (2016) [2].

Among the nine dimensions, self-confidence ranked first with a mean percent score of 80.86, followed by cosmopolitaness, decision-making ability, innovativeness, risk orientation, coordinating ability, information-seeking behavior, planning ability and achievement motivation.

Higher self-confidence may be attributed to exposure to scientific dairy farming practices, interaction with experts and motivation received during training. However, relatively lower scores for planning ability and achievement motivation indicate that future EDPs should include more sessions on business planning, project preparation, market assessment and enterprise management.

Table 1: Ranking of different dimensions of entrepreneurial behavior among trainees

Dimension	MPS	Rank
Self-confidence	80.86	I
Cosmopolitaness	68.89	II
Decision-making ability	67.47	III
Innovativeness	61.11	IV
Risk orientation	55.43	V
Coordinating ability	50.74	VI
Information-seeking behavior	50.19	VII
Planning ability	47.53	VIII
Achievement motivation	46.17	IX

Knowledge, attitude and adoption of scientific dairy practices

The overall knowledge index of trainees regarding scientific dairy farming practices was 57.10 ± 1.70 . Majority of respondents had medium knowledge level (65.93%), followed by high (19.78%) and low (14.29%) levels. This indicates that training helped in improving awareness regarding scientific dairy farming, though additional practical orientation is required in specific areas. Similar medium knowledge level among dairy farmers was reported by Kankarne *et al.* (2017) [14].

Most respondents had favourable attitude towards scientific dairy farming. About 74.73 percent of respondents belonged to the favourable attitude category, 9.89 percent had more favourable attitude and 15.38 percent had unfavourable attitude. The favourable attitude may be due to increased awareness regarding the benefits of scientific dairying and enterprise-oriented training. Similar positive effect of training intervention on attitude formation among dairy farmers was reported by Khode *et al.* (2018) [15, 16].

Adoption of scientific dairy practices was mostly at medium level. About 60.49 percent respondents had medium adoption level, followed by low (20.99%) and high (18.52%) adoption levels. Practices such as feeding green and dry fodder, artificial insemination, pregnancy diagnosis, cleaning and grooming of animals, fixed-time milking,

colostrum feeding and FMD vaccination were commonly adopted. However, adoption of silage making, biogas plant establishment, vaccination against certain diseases, quarantine of new animals and some biosecurity practices was comparatively low. Similar medium adoption level of good dairy management practices was reported by Gupta *et al.* (2020) [12].

Table 2: Distribution of trainees according to knowledge, attitude and adoption levels

Variable	Category	Frequency (%)	Mean $\pm$ S.E.
Knowledge	Low	13 (14.29)	57.10 $\pm$ 1.70
	Medium	60 (65.93)	
	High	18 (19.78)	
Attitude	Unfavourable	14 (15.38)	25.74 $\pm$ 0.25
	Favourable	68 (74.73)	
	More favourable	9 (9.89)	
Adoption	Low	19 (20.99)	
	Medium	55 (60.49)	
	High	17 (18.52)	

Income generation from dairy enterprise

Income generation was assessed among 32 respondents who started new dairy enterprises after training. Before training, the mean annual income from dairy enterprise was Rs. 5,83,750, which increased to Rs. 21,53,229 after training. The average increase in annual income was Rs. 15,69,479, indicating a 65.76 percent change. The paired t-test value was 11.66, which was significant at $p < 0.01$.

This clearly indicates that the Dairy Farming and Milk Processing EDP had a significant positive effect on income generation among new dairy entrepreneurs. The increase in income may be due to better herd management, adoption of improved practices, scientific feeding, health care, better utilization of available resources and enterprise expansion after training. Similar positive impact of extension interventions on dairy farmers' livelihood and income was reported by Garai *et al.* (2017) [10].

Income enhancement was also related to herd size. Respondents with large herd size recorded higher average income change than those with small and medium herd sizes. This shows that enterprise scale plays an important role in income generation from dairying. However, even small and medium dairy enterprises showed improvement after training, suggesting that scientific management and business orientation can improve profitability at different scales.

Table 3: Before-after comparison of income and employment generation among new dairy entrepreneurs

Particular	Before training	After training	Paired t-value
Annual income from dairy enterprise (Rs.)	5,83,750	21,53,229	11.66*
Annual employment generation (man-days)	144.00	434.15	9.0015*

*Significant at $p < 0.01$

Employment generation from dairy enterprise

Employment generation was assessed by considering different dairy operations such as feeding, watering, milking, milk-product preparation, grooming, bathing, cleaning, record keeping, health care, input purchase, feed preparation, silage making and grazing. The mean annual employment generation increased from 144.00 man-days before training to 434.15 man-days after training. The average increase was 290.15 man-days per year, representing 64.74 percent change. The paired t-test value

was 9.0015, which was significant at $p < 0.01$.

This indicates that the EDP not only improved income but also generated additional employment through family labour and hired labour. Dairy enterprises provide regular work throughout the year, unlike seasonal crop-based employment. The findings are in agreement with Lal and Thakur (2009) [17], who reported that animal husbandry training improved employment generation among rural youth.

The employment generation was higher among commercial dairy units as compared to small household units. Newly established dairy enterprises depended more on hired labour, while traditional dairy units depended mostly on family labour. Thus, dairy entrepreneurship has the potential to create direct and indirect employment in rural areas.

Relationship among selected variables

Correlation analysis revealed that education had a positive and significant relationship with attitude and adoption. Dairy farming experience was positively and highly significantly associated with adoption, entrepreneurial behavior and knowledge. This indicates that experienced dairy farmers had better understanding of dairy practices and higher tendency to adopt improved practices.

Attitude was positively and significantly associated with adoption, indicating that respondents with favourable attitude were more likely to adopt scientific dairy practices. Adoption was also positively associated with entrepreneurial behavior and knowledge. Knowledge had a positive and highly significant relationship with entrepreneurial behavior, suggesting that knowledge enhancement is important for developing entrepreneurial aptitude.

Income generation was positively and significantly correlated with attitude, entrepreneurial behavior and social participation. Employment generation was positively and significantly correlated with knowledge, entrepreneurial behavior, social participation and income generation. This indicates that knowledge, favourable attitude, social participation and entrepreneurial behavior are important factors for improving economic outcomes from dairy entrepreneurship.

Table 4: Correlation of income generation and employment generation with selected variables

Variable	Income generation	Employment generation
Knowledge	0.182	0.369**
Attitude	0.256*	0.127
Entrepreneurial behaviour	0.475**	0.778**
Social participation	0.318**	0.225*
Income generation	1.000	0.659**

*Significant at $p < 0.05$; **Significant at $p < 0.01$

Constraints faced by trainees

The trainees faced several constraints while establishing and running dairy enterprises. Among socio-economic constraints, non-availability of credit was one of the major limitations, followed by high capital investment, non-availability of labour and high input cost. Financial constraints reduce the ability of trainees to purchase good-quality animals, construct scientific housing, arrange machinery and expand the enterprise. Similar constraints among dairy farmers were reported by Adhikari *et al.* (2020) [1].

Among institutional constraints, lack of awareness and access to government schemes was important. Other constraints included distant location of artificial insemination centres and veterinary hospitals, poor extension services, and non-availability of timely veterinary and breeding services. These constraints indicate the need for stronger linkage between training institutions, banks, government departments, veterinary hospitals and dairy cooperatives.

Among marketing constraints, low and irregular payment for milk ranked high, followed by large profit margin consumed by middlemen and difficulty in finding nearby markets. These constraints affect profitability and discourage enterprise expansion. Therefore, future EDPs should include orientation on milk marketing channels, cooperative linkage, value addition, product branding and direct marketing.

Training-related constraints differed between online and offline trainees. In online training, lack of practical exposure was the most important constraint, followed by lack of confidence in applying knowledge, PowerPoint-dominated classes, lack of personal interaction and absence of learning by doing. Similar limitations of online learning were reported by Coman *et al.* (2020) [5]. Hence, online EDPs should be supported with practical videos, live farm demonstrations, interactive sessions, exposure visits and post-training field guidance.

Conclusion

The Dairy Farming and Milk Processing Entrepreneurship Development Programme organized by IVRI-Pashu-Vigyan Incubator had a positive effect on dairy entrepreneurship development. The programme motivated a considerable number of trainees to initiate new dairy enterprises and helped improve knowledge, attitude, adoption and entrepreneurial behavior. Majority of respondents had medium levels of entrepreneurial behavior, knowledge and adoption, while most had favourable attitude towards scientific dairy farming.

The EDP significantly improved income and employment generation among new dairy entrepreneurs. Mean annual income increased from Rs. 5,83,750 to Rs. 21,53,229 after training, while employment generation increased from 144.00 to 434.15 man-days per year. Entrepreneurial behavior, social participation, knowledge and attitude were important factors associated with income and employment generation.

However, constraints such as non-availability of credit, high capital investment, lack of awareness about government schemes, weak market linkage, low and irregular milk payment, insufficient veterinary and AI services and lack of practical exposure limited the full impact of the programme. Therefore, future dairy EDPs should emphasize practical demonstrations, exposure visits, business-plan preparation, credit linkage, government scheme awareness, market support, value addition and systematic post-training handholding. Strengthening these components can make EDPs more effective in converting trained youth and farmers into successful dairy entrepreneurs and improving rural livelihood security.

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