A Comparative Analysis of Knowledge Level of Dairy Farmers Regarding Scientific Farming Practices in Karnal District

Sruthi C.O.[1], B.S. Meena[2], Vishnu Priya A.[3] and V.V. Solanki[4]*
[1]Ph.D. Research Scholar, Agricultural Extension Education,
Sardarkrushinagar Dantiwada Agricultural University, Dantiwada (Gujarat), India.
[2]Principal Scientist, Dairy Extension Division, ICAR- National Dairy Research Institute, Karnal (Haryana), India.
[3]M.Sc. Scholar, Dairy Extension Division, National Dairy Research Institute, Karnal (Haryana), India.
[4]Agriculture Officer, Sardarkrushinagar Dantiwada Agricultural University, Dantiwada (Gujarat), India.

(Corresponding author: Sruthi C.O.*)
(Received: 09 June 2024; Revised: 28 June 2024; Accepted: 22 July 2024; Published: 14 August 2024)
(Published by Research Trend)

ABSTRACT: The current study was carried out in Karnal district of Haryana. In order to examine how farmers farm school has influenced the knowledge of farmers in dairy farming practices, this investigation used an ex-post-facto cause-effect research design. For this study, knowledge test with a total of 26 questions under the criteria of breeding, feeding, health care, and management methods was employed. The mean scores for beneficiary farmers' knowledge of scientific breeding, feeding, health care, and management methods were found to be 12.73, 17.32, 10.40, and 25.08, respectively. These scores were found to be significantly ($p < 0.01$) greater than those recorded for non-beneficiaries, who had mean scores of 8.42, 9.48, 5.93, and 14.58. The beneficiary farmers were found to have significantly more overall knowledge of scientific dairying practices than that of non-beneficiaries with mean score 25.08.

Keywords: Farmers farm school, Knowledge, Dairy farming, Transfer of technology.

INTRODUCTION

Cattle, Buffalo and goat forms the major part of dairy animals of the country. The overall cattle, buffalo, and goat population in the country is 192.4 million, 109.85 million, and 148 million, respectively, according to the twentieth livestock census. The contribution of livestock sector to total GVA is showing an increasing trend and thus dairying in India can be seen as an instrument for social change. Millions of small producers dispersed throughout the rural areas contribute to the major share in nation's milk supply. These farmers have an average herd of one or two milch animals, mostly cows and/or buffaloes. Around seventy per cent of the national milch animal herd is owned by small and marginal land holding farmers and by landless farmers and thus is the milk production (Government of India, 2019). The majority of the dairy animals in the state are buffalo and cattle. According to the twentieth livestock census figures, the state's overall livestock population is 71.26 lakhs, with dairy animals accounting for 66.44 lakhs (Government of Haryana, 2020).

India is a country of villages where farmers live in widely dispersed communities which makes it difficult to motivate the farmers about new innovations in agriculture and dairying. Over the years, the transfer of technology has focused on such improved technologies and it has been a common target of most agricultural research. It is well known that farming conditions are

different and technologies has to be according to these varying needs. Knowledge is an important factor to realize productivity increases in dairying as well as to gain information regarding the improved practices in dairying. During the past few years, dairy farmers in this state are facing constraints such as lack of proper and technical knowledge regarding dairy farming and improved technologies. The loss of productivity occurred due to the lack of adoption of improved production technologies. Large scale adoption of innovation is an essential feature of dairy development. However, some do adopt these practices and others do not. Looking the problems faced by the dairy farmers in this area, establishing farmers farm school was felt as a need to tackle these issues.

The knowledge level of dairy farmers regarding scientific farming practices plays a critical role in determining the success and sustainability of dairy farming operations. In recent years, there has been a growing emphasis on the need to enhance this knowledge base to improve productivity and ensure the economic viability of smallholder dairy farmers. Despite numerous advancements in agricultural science and technology, the gap between research and actual farming practices remains significant, particularly among small-scale and resource-limited farmers. This gap is often due to the lack of access to reliable information and effective training mechanisms that can

bridge this knowledge divide (Garai *et al.,* 2023; Suresh *et al.,* 2023).

Farmers' farm schools have emerged as a promising model to address this issue, providing a platform for the dissemination of scientific knowledge and best practices directly to the farmers. These schools offer hands-on training and continuous learning opportunities, which are essential for the adoption of new technologies and practices in dairy farming (Gite, 2023; Rao and Kherde 2023). The relevance of this study is underscored by the critical need to evaluate and enhance the effectiveness of such interventions, particularly in regions where traditional farming methods still dominate (Kumar *et al.,* 2023).

Several studies have demonstrated that farmers who participate in these educational programs exhibit significantly higher levels of knowledge and are more likely to adopt scientific farming practices compared to non-participants (Sahu *et al*., 2023). However, there is still a considerable segment of the farming population that remains unengaged with these initiatives, thereby missing out on the potential benefits (Sharma *et al.,* 2023). This disparity highlights the importance of expanding the reach of such programs and ensuring that all farmers, regardless of their socioeconomic status, have access to the knowledge necessary for improving their dairy farming practices.

Farmers farm school was established on August 30, 2014. It started with the aim to enhance the productivity of agricultural products. The objectives of this approach were to educate the farming community on latest know-how of agricultural innovations, to empower the farm youth through capacity building, to minimize the cost of agricultural production and to strengthen the linkages of researcher and end users. Farmers farm school is a farmer centred adult education system, which is a refined form of farmers field school and have the principles drawn from farmers field school (Groeneweg *et al*., 2006). The knowledge added from these activities permits participants to style their own locally specific choices about farm management practices (Kenmore, 2002). It differs from the conventional, top-down "transfer of technology" method as an extension approach. Farmers and researchers communicate to ask for help only when they cannot solve a problem by themselves (Dhamankar and Wongtschowski 2014). This study aims to assess the current knowledge levels of dairy farmers regarding scientific farming practices and to evaluate the impact of farmers' farm schools on knowledge enrichment. By identifying the gaps and challenges in the current knowledge dissemination processes, the study seeks to contribute to the development of more effective strategies for farmer education and support, ultimately leading to improved outcomes in the dairy sector.

Keeping the above scenario in mind, the present study entitled "A Comparative Analysis of Knowledge Level of Dairy Farmers Regarding Scientific Farming Practices in Karnal District" was undertaken in order to analyse the impact of Farmers farm school in knowledge gain and extend of adoption among the beneficiaries in comparison with non-beneficiaries.

MATERIALS AND METHODS

The present study was conducted in Karnal district of Haryana. Karnal district was selected purposively as five batches of farmers farm school were successfully organized and sixth is in progress. The responses were collected from the beneficiary farmers of five batches. To assess the knowledge and adoption, 60 beneficiaries and 60 non-beneficiaries were selected from same villages (Gorgarh, Deepo, Bhoji Khalsa and Johar Majra) under the study following simple random sampling and thus forming a total sample size of 120. The selection criteria for non-beneficiaries were those who have at least two dairy animals in milk and five years of experience in dairying.

In this study, an ex-post-facto cause to effect methodology was employed. It is a type of investigation where the investigator hypothesises potential reasons for an impact that has already taken place. Because the independent variables' manifestations have already happened or because they cannot be modified in any manner, it is structured empirical research where the experts or scientists have no direct influence over them. The course of action is determined through selection rather than manipulation. There are two categories of ex-post-facto study designs: cause to effect design and effect to cause design, according to Mulay and Sabarathanam (1980); Seltiz *et al*. (1976); Ray and Mondal (2006). Fig. 1 depicts a diagrammatic representation of this scenario. In this study, where the socioeconomic and sociocultural backgrounds of beneficiaries and non-beneficiaries were matched, the impact of farmers farm school on improving respondents' knowledge and adoption of dairy farming practises were assessed by following this research design. The expected benefits, particularly changes in knowledge and acceptance of scientific dairy farming practises, are the result of a one-year farmers farm school programme established in these areas by ICAR-NDRI.

Knowledge is operationalized as the extent of information possessed by the respondents in dairy farming practices. This objective's primary purpose was to find out how knowledgeable farmers are about the scientific dairy farming practices and whether any difference in knowledge exists between the beneficiary farmers and non-beneficiaries. Knowledge test developed by Meena *et al.* (2015), was used for this study. Breeding practices, feeding practices, health care practices and management practices were the five key parameters tested. The number of questions structured under breeding, feeding, health care, and management practices were 5, 7, 4, and 10, respectively, for a total of 26 questions in the test. Score from 0 to 3 was assigned for each question and further analysis was carried out by finding out weighted mean score. Weighted mean score was calculated for each parameter under study and then overall knowledge was also represented in weighed mean score. The obtained weighted mean score was expressed in percentage which makes the study easier to rank them to find out the difference in

knowledge among beneficiary farmers and non-beneficiaries.

RESULTS AND DISCUSSION

Knowledge on dairy farming. The extent of information possessed by respondents in dairy farming practices is defined as knowledge. Knowledge of dairy farming practices was assessed among both beneficiaries and non-beneficiaries in four areas: breeding, feeding, health care, and management. Table 1 demonstrates that both beneficiary and non-beneficiary group farmer's knowledge on scientific breeding practices were 12.73±0.34 and 8.42±0.39, respectively. It also shows that beneficiaries' knowledge of dairy farming practices was considerably (p 0.01) greater than that of non-beneficiaries. The data shown in Table 1 evidently portrayed that the mean score of knowledge possessed by beneficiary farmers on feeding methods was more than those who did not attend farmers farm school programme, with mean scores of 17.32±0.44 and 9.48±0.50, respectively. The table also showed that the mean knowledge scores for dairy animal scientific health care practices among both the farmer groups namely beneficiaries and non-beneficiaries of farmers farm school were 10.40±0.26 and 5.93±0.24, respectively. Farmers who received assistance from farmers farm school had substantially (p <0.01) more knowledge of dairy animal healthcare techniques than farmers who did not receive benefits, according to this finding. Farmers Farm School scientists monitored the health of dairy animals on a regular basis. This could explain why Farmers Farm School beneficiaries have a higher knowledge level and more advanced comprehension. In terms of knowledge about dairy animal management practices, beneficiaries of farmers farm school had significantly (p < 0.01) greater knowledge than non-beneficiaries, with mean scores of 25.08±0.64 and 14.58±0.58, respectively. Beneficiary farmers had significantly greater overall knowledge of scientific dairy farming techniques than non-beneficiaries (p <0.01), as did other components of assessing knowledge of scientific dairy farming techniques. Farmers Farm School, according to the findings, had a positive impact on the beneficiaries' knowledge base.

The results indicated in the figure 2 shows the extent of knowledge of beneficiaries on breeding, feeding, health

care and management practices contributed 84.89, 82.46, 86.67 and 83.61 per cent, respectively to the overall knowledge clubbing to a total of 84.02. In contrast to this, knowledge possessed by the non-beneficiaries differed from that of beneficiaries as their overall knowledge with 49.25 per cent was observed from the contributing factors such as 56.11 per cent of breeding, 45.16 per cent of feeding, 49.44 per cent of health care and 48.61 per cent of management practices. Among the components, knowledge of beneficiaries in health care was found to be the highest followed by breeding in comparison with other components. Whereas non-beneficiaries possessed comparatively high knowledge on breeding followed by health care though it was significantly less than those of beneficiaries.

The results of this study were consistent with those of a study by Garai *et al.* (2017) in the Nadia district of West Bengal, which involved interviewing 120 respondents from four villages to assess the impact of extension interventions in enhancing the livelihood of the dairy farmers there. The results of the current study concurred with those of Sivashankar and Khedgi (2011), who looked at how a training programme affected 100 SHG members in the Sandur Taluk of the Bellary District of Karnataka in order to determine how their economic condition changed and how their knowledge level was increased. Their findings demonstrated that training had a significant effect on the respondents' knowledge levels. There was a profound disparity in farmers' interest groups' comprehension of cattle feed combinations before and after training in Tamilnadu's Vellore district, according to Kumar *et al.* (2013). It was also consistent with the findings of Rahman and Gupta (2015); Biswas *et al.* (2011); Prakash (2009); Ganguly (2005).

Relationship between the socio-economic profile and knowledge level of the respondents. It is clear from the Table 2 that variables namely, milk production, milk consumption, extension contact, mass media exposure, participation in extension activities, group orientation and satisfaction regarding the NDRI services are having highly significant positive correlation with knowledge level observed. Education and milk sale were found to have positive and significant correlation.
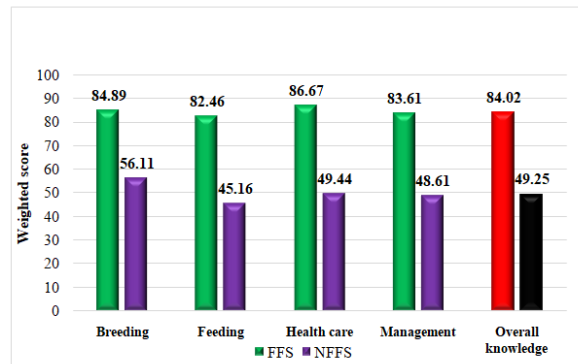
Table 1: Knowledge on dairy farming.

Sr. No.	Categories	Beneficiaries (n₁=60)		Non- beneficiaries (n₂=60)		U statistics	Z value	P value
		Mean	Extent of knowledge (%)	Mean	Level of knowledge (%)			
1	Breeding	12.73±0.34	84.89	8.42±0.39	56.11	431.000	-7. 247	0.000
2	Feeding	17.32±0.44	82.46	9.48±0.50	38.65	172.500	-8.568	0.000
3	Health care	10.40±0.26	86.67	5.93±0.24	49.44	231.500	-8.366	0.000
4	Management	25.08±0.64	83.61	14.58±0.58	48.61	220.500	-8.344	0.000
	Overall knowledge	65.53±1.07	84.02	38.42±1.20	47.50	89.000	-8.985	0.000

Table 2: Correlation analysis of independent and dependent variables.

Variables	Coefficient of correlation (r)
Age	-0.061
Education	0.226*
Experience	0.109
Family size	0.027
Operational land holding	0.084
Family education status	0.980
Occupation	-0.053
Herd size	0.124
Milk production	0.399**
Milk consumption	0.132**
Milk sale	0.195*
Annual income	0.104
Extension contact	0.595**
Mass media exposure	0.613**
Participation in extension activities	0.272**
Feeding schedule	0.112
Group orientation	0.810**
Satisfaction	0.772**
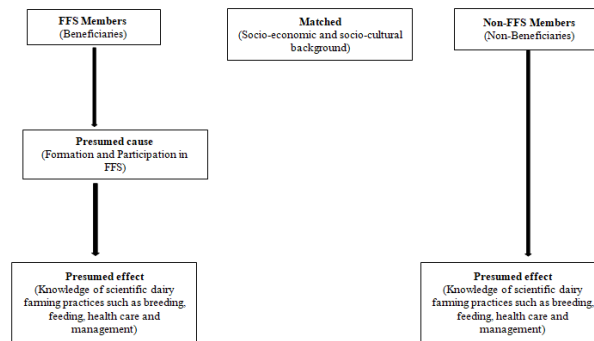
Fig. 1. Research design; Ex-post facto cause to effect research design.

Fig. 2. Extent of knowledge of respondents in dairy farming.

CONCLUSIONS

Beneficiaries and non-beneficiaries differed significantly (p <0.01) in their knowledge of improved dairy farming practices. The data demonstrated that the beneficiaries' level of knowledge on breeding, feeding, health care, and management practices was significantly greater than that of the non-beneficiary farmers. The data gathered after interpretation clearly indicated that farmers farm school had a significant impact in imparting and strengthening the knowledge level of the enrolled dairy farmers about dairy farming through regular and need-based classes. It has thus been established that Farmers Farm School had a positive impact on knowledge acquisition of dairy farming practices. As a result, it is advised to expand its area of coverage to the adjacent villages and gradually cover the entire state so that dairy farmers from all regions of the state can benefit.

FUTURE SCOPE

Future research could expand by incorporating longitudinal studies to track changes in dairy farmers' knowledge over time, assessing the impact of targeted educational interventions on practice adoption. Comparative studies involving different regions could highlight varying regional challenges and successes. Additionally, exploring the role of digital tools and

technologies in enhancing knowledge dissemination and practice implementation could provide valuable insights. Investigating the socioeconomic factors influencing knowledge levels and their correlation with farming outcomes could further refine strategies for effective knowledge transfer and practice improvement.

REFERENCES

Biswas, S., Sikdar, D. P. and Goswami, A. (2011). Study on comparative knowledge level about improved dairy farming practices of SHG and non-SHG members in West Bengal. *Indian Research Journal of Extension Education 12* (1), 104-109.

Dhamankar, M. and Wongtschowski, M. (2014). Farmer Field Schools (FFS). Note 2. *GFRAS Good Practice Notes for Extension and Advisory Services.*

Ganguly, S. (2005). *A study of Women Self Help Group Dynamics in Dairying* [M.Sc. thesis]. NDRI (Deemed University), Karnal, Haryana

Garai, S., Garai, S., Maiti, S., Meena, B. S., Ghosh, M. K., Bhakat, C., and Dutta, T. K. (2017). Impact of extension interventions in improving livelihood of dairy farmers of Nadia district of West Bengal, India. *Tropical animal health and production*, *49*(3), 641-648.

Garai, S., Ghosh, M. K., Bhakat, C. and Dutta, T. K. (2023). Impact of extension interventions in improving livelihood of dairy farmers. *Tropical Animal Health and Production.*

Gite, N. R. (2023). An overview of knowledge level of dairy farmers and farm women related to improved dairy farming practices in India. Asian Research Consortium.

Government of Haryana (2020). Handbook on 20th Livestock Census. Animal Husbandry & Dairying Department.

Government of India (2019). Department of Animal Husbandry and Dairying. Ministry of Fisheries, Animal Husbandry and Dairying, New Delhi.

Groeneweg, K., Buyu, G., Romney, D. L. and Minjauw, B. (2006). Livestock farmer field schools–guidelines for facilitation and technical manual.

Kenmore, P. E. (2002). Integrated pest management. Introduction. *International Journal of Occupational and Environmental Health*, *8*(3), 173-174.

Kumar, B. R, Baskaran, D., Saraswathi, S. and Kumar, C. T. A. (2013). Impact of training program in adoption of cattle feed computation by farmer interest groups (FIGs) of Tamil Nadu. *Tamilnadu J. Veterinary & Animal Sciences, 9*(4), 264 – 271.

Kumar, B. R, Saraswathi, S. and Ram, H. (2023). Adoption of scientific dairy farming practices among farmers: A review. *Indian Journal of Dairy Science, 77*(1), 45-53.

Mulay, S. and Sabarathanam, V. E. (1980). Research Methods in Extension Education. Manasyam, New Delhi.

Prakash, A. (2009). *Impact of Self-Help Groups on Growth of Dairy Farming in Haryana*, [Ph.D. thesis]. NDRI (Deemed University), Karnal, Haryana.

Rahman, S. and Gupta, J. (2015). Knowledge and adoption level of improved dairy farming practices of SHG members and non-members in Kamrup district of Assam, India. *Indian Journal of Animal Research*, *49*(2), 234-240.

Rao, B. S. and Kherde, R. L. (2023). Enhancing dairy farming productivity through farmers' education programs. *Journal of Extension Education, 29*(3), 65-72.

Ray, G. L. and Mondal, S. (2006). Research Methods in Social Sciences and Extension Education. Kalyani Publishers, Ludhiana.

Sahu, R. P, Singh, R. J. and Mehta, K. (2023). Knowledge dissemination in dairy farming: Role of extension services. *Journal of Rural Studies, 82*, 123-129.

Seltiz, C, Wrightsman, L. S. and Cook, S. W. (1976). Research Methods in social relations. Holt, Rinehart and Winston, New York.

Sharma, M., Singh, G. and Keshava, R. (2023). Evaluating the impact of dairy farming training programs in India. *Journal of Agricultural Extension, 61*(4), 225-232.

Sivashankar N. and Khedgi, K. (2011). Influence of trainings on the knowledge level of Self-Help Group Members. *Stud Home Com Sci., 5*(3), 135-140.

Suresh, G. T., Harisha, M., Ashok, M. and Giridhar, K. S. (2023). A study on effectiveness of dairy farming-related Front Line Demonstrations. *Journal of Experimental Agriculture International, 45*(10), 116-121.