

Adoption Level of Good Dairy Management Practices among Dairy Farmers in Central Plain Zone of Uttar Pradesh, India

Jagdeep Gupta¹, S. Subash¹, M. C. A. Devi¹ and Kalyan Mandi^{1*}

¹Dairy Extension Section, Southern Regional Station, ICAR-National Dairy Research Institute, Bangalore, Karnataka 560030, India.

Authors' contributions

The work was carried out in collaboration among all authors. Author JG designed the study, performed the statistical analysis and wrote the first draft of the manuscript. Author KM managed the literature searches of the study and checked the first draft. Author SS was the Major Advisor and Chairperson and author MCAD was one of the Research Advisory Committee members who guided in publication of this research paper. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2020/v39i1330679

Editor(s):

(1) Dr. Orlando Manuel da Costa Gomes, Lisbon Accounting and Business School (ISCAL), Lisbon Polytechnic Institute, Portugal.

Reviewers:

(1) Geraldo Márcio da Costa, Federal University of Lavras, Brazil.

(2) Michael Hässig, University of Zurich, Switzerland.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/57389>

Original Research Article

Received 20 March 2020

Accepted 26 May 2020

Published 03 June 2020

ABSTRACT

Good dairy management practices are a widely important tool for facilitating and promoting farmers' production and marketing of healthy, high quality milk and milk products to meet food and consumer expectations. In this context, the present research study was designed to make an attempt to find out the extent of adoption of animal welfare practices by the dairy farmers at field level. The study was conducted in the Central plain zone of Uttar Pradesh State. Four districts (Hardoi, Auraiya, Allahabad and Kaushambi) were selected purposively. One block from each district and from each block two villages and from each village 15 farmer-respondents were selected randomly. A total of 120 respondents were finally approached for the primary data collection. The salient findings with regard to adoption of good dairy management practices revealed that, more than half of the respondents (55.83%) belonged to medium level of adoption category, followed by 27.56 and 16.67% in low and high level of adoption category, respectively.

*Corresponding author: E-mail: kalyan.mandi@gmail.com;

The study further suggests sensitizing and training the extension personnel's /veterinarians about the good dairy management practices and strengthening the dairy extension services among dairy farmers in the study area.

Keywords: Adoption; dairy; good; management; practices.

1. INTRODUCTION

India is the world's largest producer of milk, with 21 percent of global production. As, a global leader in milk production, the total bovine population in India is estimated at 302.79 million, out of which cattle is 192.49 million and buffalo is 109.85 million [1]. Milk is one of the major outputs of dairy sector and most of the milk in the country is being produced by small and marginal farmers coupled with landless labourers. India now attained the status of world's largest milk producing nation with an annual production of 187.7 million tones and subsequently the per capita availability of milk hovering around 394 g/day [2]. The annual growth rate in milk has been estimated at 6.50 per cent. Dairy sector is the most important sub-sector of livestock, milk group accounts for 67 per cent of the value of output from livestock sector [3]. Good Dairy Management Practices is an important tool used world-wide to guide/facilitate farmers to produce and market safe and quality milk and milk products to satisfy the expectations of the food industry and consumers [4]. Hence, the employment of good dairy management practices at the farm level to the consumption level is essential. However, past studies have highlighted several practices adopted by various stakeholders engaged in dairy farming. It was observed that that colostrum feeding, paddy straw feeding, maintenance of sire hygiene, better mineral mixture supplementation, bathing and deworming were adopted by majority of the dairy farmers [5]. Similarly, a large majority of farm women adopted the practices like maintenance of separate cattle shed and feeding of colostrum to the calf within six hours [6]. Further, a study on knowledge and adoption of livestock feeding practices in Jhansi district of Bundelkhand reported that majority of farmers (73.50%) fell under medium level of adoption of improved feeding practices [7]. On similar lines, an adoption of good farming practices in central plain and eastern plain zones of Uttar Pradesh revealed that majority (86.25%) of respondents had low level of adoption followed by 7.50% as high and 7.50% as medium level of adoption [8]. Further study on adoption of improved dairy management, conducted in Maharashtra State,

concluded that majority (72.50%) of the dairy farmers belonged to medium level of adoption followed by 15.83% in low and 11.67% in high level of adoption category [9]. Therefore, the development of any dairy farms aims to improve the overall livestock keeping practices and animal welfare for the sheltered cows in a sustainable manner and keeping this in view the aim of the present study was to investigate the level of adoption of good dairy management practices by the dairy farmers of central plain zone of Uttar Pradesh State.

2. MATERIALS AND METHODS

The study was undertaken in the Central plain zone of Uttar Pradesh State, India. Four districts (Hardoi, Auraiya, Allahabad and Kaushambi) were selected purposively based on highest and lowest bovine population and milk production. One block from each district and from each blocks two villages and from each village 15 farmer-respondents were selected based on random selection. Therefore, a total of 120 respondents were finally approached for the primary data collection. The data was collected from the primary and secondary sources through a well-structured questionnaire, pre-tested in one case among respondents from non-sampled area. Good Management Practices (GMPs) was operationally defined as the degree to which a respondent actually adopts a practice for the purpose of measurement of extent of adoption of GMPs in their Gaushalas at the time of investigation and it was determined by using adoption index developed Singh A. K (2015) with slight modification [10]. The practices were classified into five categories namely, animal health practices, hygienic milking practices, nutritional practices, environmental practices and socio-economic management practices. By this procedure, final 35 statements for the index were selected, modified and rewritten as per the comments of judges. Against each of the practices, there were two columns representing 'adopted', and 'not adopted' with score of 1 and 0 respectively. The adoption score was then converted into adoption index by applying following formula:

$$\text{Adoption Index} = \left(\frac{\text{Obtained Adoption Score}}{\text{Maximum Obtainable Adoption Score}} \right) \times 100$$

According to the final score values obtained, the dairy farmers were categorized into three groups namely, 'Low', 'Medium' and 'High' adopter categories considering the mean and standard deviation. The total score obtained by respondents was calculated and with the help of following formula their adoption level for various practices and overall adoption level were calculated.

3. RESULTS AND DISCUSSION

The results depicts a comprehensive analysis of adoption of good dairy management practices accessed at 5 level of indicators viz. animal health practices, hygienic milking practices, nutritional practices, environmental practices and socio-economic management practices. Finally, the overall adoption represented the extent to

which good dairy management practices was espoused by the dairy farmers in the study area.

3.1 Adoption Level of Dairy Farmers in Animal Health Practices

It could be inferred from the Table 1 that, majority of the farmers (90.00%) adopted 'immediate care of sick animals and follow-up', followed by 81.66 per cent were 'using quality medicines from certified pharmacies' and 74.17 per cent of the farmers 'adopted vaccination of all animals as per the recommended schedule'. As the vaccination of animal is very important with regard to economic returns and also due to animal vaccination programme on regular basis, were adopted in the husbandry practices by majority of the respondents. In the case of non-adoption, majority of the farmers (85.00%) were not adopting the 'regular health check-up for signs of diseases', followed by 83.33 per cent of the farmers were 'not using any identification and

Table 1. Distribution of farmers according to their adoption level in animal health practices (n=120)

| Sl. No. | Statements | Adopted (%) | Not-adopted (%) |
|---------|---|-------------|-----------------|
| 1. | Selection of breeds and animals from known source and well suited to the local environment and farming system | 27.50 | 72.50 |
| 2. | Vaccination of all animals as recommended schedule | 74.17 | 25.83 |
| 3. | Using an identification system and maintenance of health record that allows all animals to be identified individually from birth to death | 16.67 | 83.33 |
| 4. | Health check-up for signs of disease | 15.0 | 85.0 |
| 5. | Immediate care of sick animals and follow-up | 90.0 | 10.0 |
| 6. | Isolation of sick animals | 66.67 | 33.33 |
| 7. | A regular deworming to control external and internal parasites | 34.17 | 65.83 |
| 8. | Use of quality medicine from certified pharmacies as per recommended dosages | 81.66 | 18.33 |

Table 2. Distribution of farmers according to their adoption level in hygienic milking practices (n=120)

| Sl. No. | Statements | Adopted (%) | Not-adopted (%) |
|---------|---|-------------|-----------------|
| 1. | Maintaining clean housing and milking area | 56.66 | 43.34 |
| 2. | Ensuring basic hygiene measure for milking | 15.0 | 85.0 |
| 3. | Ensuring dis-infection after each milking | 15.83 | 84.17 |
| 4. | Segregation of milk drawn from sick or under-treatment animals for appropriate disposal | 15.0 | 85.0 |
| 5. | Ensuring chilling of milk or delivered for processing within the specified time | 97.50 | 2.50 |
| 6. | Ensuring milking utensils are cleaned before and after milking | 85.0 | 15.0 |

maintenance of health record that allows all animals to be identified individually from birth to death' and 65.83 per cent of the farmers were 'not using regular deworming for control of external and internal parasites'. In the non-adoption category most are preventive practices and most of the farmers in study area were focusing more on curative measures of animal health rather than preventive measures, which could be one of the reasons for non-adoption of these practices.

3.2 Adoption Level of Dairy Farmers in Hygienic Milking Practices

Results shown in the Table 2 revealed that, majority of the farmers (97.50%) in the study area adopted 'proper handling of milk within the specified period of time', followed by 'using clean milking utensils' by 85.00 per cent and 56.66 per cent of the farmers were 'maintaining clean housing and milking area'. As observed in the study area, dairying was the major source of income for 37.00 per cent of the farmers and the respondents were very conscious in following hygienic milking practices to get right price for the same. But, in the case of non-adoption, majority of the farmers (85.00%) were 'not maintaining basic hygiene measures and segregation of milk drawn from sick or under treatment animals', followed by 84.17 per cent were not adopting 'dis-infection after each milking'. This might be due to lack of awareness and perceived importance about these practices among the farmers.

3.3 Adoption Level of Dairy Farmers in Nutritional Practices

Results shown in Table 3 indicated that, a large majority of the farmers (84.50%) adopted 'the nutritional requirements of animals met through (feed and fodder)', followed by 83.33 per cent taking 'proper care while handling chemicals' and 68.33 per cent of the farmers adopting 'feeding of sufficient colostrum to new-born calves.' This could be due to the fact that, majority of the respondents had more experience and were aware of feeding aspects of dairy cattle. In the case of non-adoption, majority of the farmers (96.67%) were 'not keeping the record of all feed and feed ingredients received on the farm', followed by 90.00 per cent of the farmers were 'not ensuring appropriate use of chemical on forage crops and observe with holding periods' and 70.84 per cent of the farmers 'planning and execution of farm input management activities for feed and fodder'. This might be due to, ignorance

of the respondents on record-keeping, less knowledge about holding periods of chemicals and less managerial ability to plan and execute the input management activities.

3.4 Adoption Level of Dairy Farmers in Environmental Practices

From the results of Table 4 it could be inferred that, majority of the farmers (80.83%) adopted the practice of 'protecting livestock from adverse environmental impacts', followed by 70.00 per cent 'maintaining housing system according to the comfort of animals' and 55.83 per cent of the farmers were 'using farm inputs such as water and nutrients effectively.' In the case of non-adoption, most of the farmers (90.00%) were 'not adopting the minimization of production of environmental pollutants from dairy farming', followed by 77.5 per cent were 'not using appropriate agricultural chemicals to avoid contamination of the local environment' and 65.00 per cent were not 'implementing the practices to reduce, reuse or recycle farm waste as appropriate.'

3.5 Adoption Level of Dairy Farmers in Socio-Economic Management Practices

It is interpreted from the Table 5 that, majority of the farmers (64.17%) were 'planning ahead to manage financial risks', followed by 38.33 per cent of the farmers were 'adopting the relevant occupational health and safety requirements in their farm' because they were very cautious about future financial risk. In the case of non-adoption, majority of the farmers (83.33%) were not implementing the 'sustainable work practices', followed by 78.33 per cent of the farmers did not 'possess appropriate procedures and equipment in place for undertaking dairy farming tasks' and 68.34 per cent of the farmers were 'not employing the labourers based on minimum wages and their welfare'. This might be due to the respondents' affordability and lack of awareness.

3.6 Overall Adoption Level of Dairy Farmers in Good Dairy Management Practices

Data presented in Table 6 in perusal of the distribution of respondents according to their overall adoption of good dairy management practices revealed that, more than half of the respondents (55.83%) had medium level of adoption, while the rest 27.50 and 16.67 percent

of the respondents had low and high levels of the adoption of overall good dairy management adoption, respectively. It can be concluded that, practices was found to be medium with a

Table 3. Distribution of farmers according to their adoption level in nutritional practices (n=120)

| Sl. No. | Statements | Adopted (%) | Not-adopted (%) |
|---------|--|-------------|-----------------|
| 1. | Planning and execution of farm input management activities for feed and fodder | 29.16 | 70.84 |
| 2. | Ensuring a sufficient supply of clean and fresh water | 35.0 | 65.0 |
| 3. | Ensuring the nutritional requirements of animals are met through feed and fodder | 84.50 | 15.50 |
| 4. | Feeding of sufficient colostrum (10% of calf body weight) to all new-born calves | 68.33 | 31.66 |
| 5. | Proper care was taken while handling chemicals and feed stuffs | 83.33 | 16.67 |
| 6. | Ensuring chemicals are used appropriately on forage crops and observe with holding periods | 10.0 | 90.0 |
| 7. | Ensuring appropriate storage conditions to avoid feed spoilage or contamination | 59.17 | 40.83 |
| 8. | Rejection of mouldy or sub-standard feed | 86.67 | 13.33 |
| 9. | Keeping records of all feed or feed ingredients received on the farm | 3.33 | 96.67 |

Table 4. Distribution of farmers according to their adoption level in environmental practices (n=120)

| Sl. No. | Statements | Adopted (%) | Not-adopted (%) |
|---------|--|-------------|-----------------|
| 1. | Using farm inputs such as water and nutrients effectively | 55.83 | 44.17 |
| 2. | Minimization of production of environmental pollutants from dairy farming | 10.0 | 90.0 |
| 3. | Adequate climatic protection and comfort housing to the animals | 70.0 | 30.0 |
| 4. | Implementation of practices to reduce, reuse or recycle farm waste as appropriate | 35.0 | 65.0 |
| 5. | Manage livestock to minimize adverse environmental impacts | 80.83 | 19.17 |
| 6. | Using appropriate agricultural chemicals and to avoid contamination of the local environment | 22.5 | 77.5 |
| 7. | Ensuring the overall application of the dairy operation so that for high quality food is harvested | 54.0 | 46.0 |

Table 5. Distribution of farmers according to their adoption level in socio-economic management practices (n=120)

| Sl. No. | Statements | Adopted (%) | Not-adopted (%) |
|---------|--|-------------|-----------------|
| 1. | Ensuring the farm working environment complies with relevant occupational health and safety requirements | 38.33 | 61.67 |
| 2. | Employ labourers based on minimum wages and their welfare | 31.66 | 68.34 |
| 3. | Have appropriate procedures and equipment in place for undertaking dairy farming tasks | 21.67 | 78.33 |
| 4. | Implementation of sustainable work practices | 16.67 | 83.33 |
| 5. | Plan ahead to manage financial risks | 64.17 | 35.83 |

Table 6. Distribution of farmers according to their overall adoption level in good dairy management practices (n=120)

| Sl. No. | Category | Frequency | Percent |
|---------|--------------------|-----------|---------|
| 1. | Low (<0.33) | 33 | 27.50 |
| 2. | Medium (0.33-0.42) | 67 | 55.83 |
| 3. | High (>0.42) | 20 | 16.67 |
| | Total | 120 | 100.00 |

significant percentage of the respondents (27.50%) were also falling in the category of low level of adoption. This clearly indicates that farmers in the study area were not completely aware about GDMPs and to some extent due to financial/resource constraints as a major reason in adoption of GDMPs. Sharma et al. [11], Singh and Chauhan [12], Aulakh and Rajbir [13] and Meena et al. [14] also reported in their respective studies that, most of the farmers had medium level of adoption in the case of adoption of good dairy management practices [11,12,14,13].

4. CONCLUSION

In case of overall adoption of good dairy management practices, more than half of the respondents (55.83%) belonged to medium level of adoption category, followed by 27.56 and 16.67 per cent in low and high level of adoption category, respectively. The non-adoption of GDMPs was attributed to lack of resources and adequate training facilities. The major constraints of dairy farmers were inferior quality of bulls, limited access to veterinary services and inadequate funds/capital and training. The identified perceived important factors affecting the performance of dairy farmers were regular financial support, good infrastructural facilities and government support for training and development. In conclusion, there is a strong need to sensitize and train various dairy stakeholders about the GDMPs through adequate extension, policy and financial support for holistic dairy farming in the country.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ACKNOWLEDGEMENT

Authors are thankful to all the faculty and staff members of the Dairy Extension Section,

Southern Regional Station, ICAR-National Dairy Research Institute, Bangalore. Thanks are also due to local informants and village headmen for their valuable support and cooperation throughout the field work.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- 20th Livestock Census. Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture; 2019. Available:[http://www.dahd.nic.in/document/s/statistics/livestock-census on 13/01/20](http://www.dahd.nic.in/document/s/statistics/livestock-census%20on%2013/01/20)
- National Dairy Development Board. Annual Report 2017-18, India; 2018.
- Department of Animal Husbandry, Dairy and Fisheries; 2019. Available:<http://www.dahd.nic.in/about-us/divisions/cattle-and-dairy-development>. [Retrieved on 16/01/20]
- Kim MK, Jeong SG, Oh MH, Kim DH, Son YS, Ham JS. Guide to good dairy farming practice. *Journal of Milk Science and Biotechnology*. 2011;29(2):75-80.
- Singh G, Sidhu SS, Verma HK, Singh G. Management practices in dairy animals in relation to reproduction in Punjab. *Journal of Research, Punjab Agricultural University*. 2001;38(1-2):98-103.
- Shreeshailaja KT. Factors influencing the productivity of milch animals managed by dairy farm women in eastern dry zone of Karnataka. Doctoral Dissertation, University of Agricultural Sciences, GKVK, Bangalore; 2000.
- Sharma P, Pandey S, Meena BS, Singh N.P. Knowledge and adoption of livestock feeding practices in Jhansi district of Bundelkhand. *Indian Journal of Dairy Science*. 2002;61(1):63-67.
- Singh AK, Saryam M, Shah R, Ghatawal JP. Compare the Extent of Adoption of

- Good Dairy Farming Practices by the Dairy Farmers in Central Plain and Eastern Plain Zones of Uttar Pradesh. Int. J. Pure App. Biosci. 2018;6(1):1383-1391.
9. Cheke SS. Constraints faced by dairy cattle farmers in adoption of Improved Dairy Management Practices. M.Sc.Thesis. Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra; 2015.
 10. Singh AK. A Comparative study on the Adoption of good dairy farming practices in the Central plain and Eastern plain zones of Uttar Pradesh. M.Sc. Thesis. ICAR National Dairy Research Institute, Karnal, Haryana; 2015.
 11. Sharma K, Singh SP, Yadav VPS. Knowledge of Dairy Farmers about Improved Buffalo Husbandry Management Practices. Indian Res. J. Ext. Edu. 2009; 9(3):51-54.
 12. Singh M, Chauhan A. Adoption of animal husbandry practices by dairy owners. Indian Journal of Dairy Science. 2009; 62(2):119-125.
 13. Aulakh GS, Rajbir S. Adoption of recommended practices by the buffalo owners. Indian Journal of Dairy Science. 2012;65(5):431-434.
 14. Meena DK, Ram H, Meena BS. Adoption of Improved Animal Husbandry practices by the members and non-members of Dairy Cooperative Societies in Bikaner. Indian J. Dairy Sci. 2012;65(4): 356-358.

© 2020 Gupta et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/57389>