Asian Journal of Agricultural Extension, Economics & Sociology

38(4): 94-100, 2020; Article no.AJAEES.57118
ISSN: 2320-7027

Adoption Level of Animal Welfare Practices among Dairy Farmers in Central Plain Zone of Uttar Pradesh

Jagdeep Gupta[1], S. Subash[1], M. C. A. Devi[1] and Kalyan Mandi[1*]

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

Authors' contributions

This 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/AJAEES/2020/v38i430341
Editor(s):
(1) Dr. Zhao Chen, University of Maryland, Maryland, USA.
Reviewers:
(1) Marta Luciane Fischer, Parana, Brazil.
(2) Michael Hässig, University of Zurich, Switzerland.
Complete Peer review History: http://www.sdiarticle4.com/review-history/57118

Original Research Article

Received 02 March 2020
Accepted 07 May 2020
Published 18 May 2020

ABSTRACT

Animal welfare assumes much significance in the era of dairy commercialization, both for health of the animals as well as to improve the farm productivity. Although animal welfare scores, scales and modules have been developed and implemented at developed countries, the outreach of animal welfare and awareness about the same has not been given due importance in developing countries including India. 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 revealed that, in case of overall adoption of animal welfare practices, more than half of the dairy farmers (55.83%) had medium level of adoption, whereas remaining 23.34 and 20.83% respondents had high and low levels of adoption, respectively. Hence, majority of the farmers were adopting the dairy management practices which met the welfare protocols of the dairy animals.

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

Keywords: Adoption; animal; dairy; farmers; welfare.

1. INTRODUCTION

The livestock sector plays a major role in the socio-economic growth of India and constitutes a large part of the rural economy. In addition to ensuring the availability of quality milk and milk products to citizens in urban and rural areas, the dairy industry provides food for millions of farmers. India enjoys the distinction of being the world's largest dairy manufacturer, accounting for over 22 per cent of the world's total dairy production as well as the world's largest dairy shareholder [1]. In the present sense, however, the increasing concern for animal welfare has brought a lot of attention around the world. According to OIE (World Organization for Animal Health), an animal is in a good state of welfare if it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear, and distress [2]. International Dairy Federation [3] in the guidelines states that animal welfare is mainly concerned with the 'five freedoms' which described the basic needs. This consists free from thirst, hunger and malnutrition, free from discomfort, free from pain, injury and diseases, free from fear and distress, and able to engage in normal patterns of animal behaviour. Hence, both failure to cope with the environment and difficulty in coping are indicators of poor animal welfare [4]. However, past studies have highlighted several animal welfare protocols adopted by various stakeholders engaged in dairy farming. Sejian et al. [5] in their study reported that animal welfare can be measured by four indicators namely behavioural, physical, physiological and production aspects. Sinha et al. [6] found in their study that around 16.67 percent had poor ventilation in the cattle shed, followed by34.44 percent with fairly good, 20.00 percent with good whereas 28.89 percent had no provision of ventilation and it was also found that, only 64.44 percent of dairy farmers were maintaining clean housing. Animal health care is an important parameter for measuring animal welfare indices. Ahmad et al. [7] found that only 18.00 per cent of farmers fed colostrums in required quantity to calves within 2 hours of birth, 82.00 per cent farmers lacked primary knowledge regarding time and quantity of colostrums feeding to calves and fed colostrums after expulsion of placenta. Another study reported that 99.00 per cent farmers were not taking proper care of calves immediately after birth; only 1.00 percent farmers followed the standard farm practices like removal of discharge from nostrils of calf, cutting of umbilical cord and applying of antiseptic etc. immediate after the birth of calf [8]. Further, Bergman et al. [9] reported that about 30.00 per cent of herds met welfare program criteria for body condition score but only about 20.00 per cent met criteria for animal hygiene scores. Overall, only 23.00 per cent of farms utilized traditional methods of pain relief (local anesthetics, analgesics, non-steroidal anti-inflammatories, or sedation) for treating their animals. Animal housing also plays an important indicator of animal welfare protocols and indirectly affects the productivity of animals. Cozzi et al. [10] in Po Valley, Italy, observed that the cattle farms were mainly characterized by animals kept at high density in multiple pens and fed high starch diets. Under these rearing conditions the limited space allowance is one of the most important critical factors to impairing animal welfare. Other risk factors for poor welfare related to the housing structures are type of floor, number of water dispensers and lack of specific moving and handling facilities. Microclimatic conditions can be critical especially during the summer season when cattle can experience heat stress. Webster [11] reported that the basic needs of farm animals should be assured by allowing free access to adequate quantities of feed and fresh water, by providing a suitable rearing environment and by avoiding physical pain or suffering of any kind. Therefore, the development of 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 animal welfare practices among the dairy farmers of study area.

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 block two villages and from each village 15 farmer-respondents were selected randomly. 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 developed and pre-tested among

respondents in the non-sampled villages. Animal Welfare Practices (AWPs) was operationally defined as the degree to which a respondent actually adopted Animal Welfare Practices in their farm at the time of investigation and it was determined by a simple adoption schedule developed by the investigator. For dairy animal welfare practices the main principles good feeding, good breeding, good health, good housing and expression of appropriate behaviour were taken. These statements were sent to 40 different dairy experts for their evaluation. The judges were asked to indicate degree of relevancy on each statement with three point continuums as 'Most Relevant, Relevant and Not Relevant' with scoring 3, 2, and 1, respectively. By using these criteria the statements having Relevancy Weightage (RW) > 0.75 were selected for including in the developing of index for adoption of dairy animal welfare practices by the respondents. By this procedure, final 38 statements for the index were selected, modified and rewritten as per the comments of judges. The various sets of items/statements were prepared under different animal welfare indicators for final data collection from the respondents. Against each of the practices, there were two columns representing 'adopted', and 'not adopted' with binary score of 1and 0 respectively. The adoption score was then converted into adoption index by applying following formula:

$$\text{Adoption Index} = \frac{\text{Obtained Adoption Score}}{\text{Maximum Obtainable Adoption Score}} \times 100$$

According to the final scores values obtained, the respondents were categorized into three groups namely, 'low', 'medium' and 'high' adopter categories considering the mean and standard deviation. The total score obtained by the respondents was calculated and with the help of following formula, their overall adoption level was calculated.

3. RESULTS AND DISCUSSION

Animal welfare assumes much significance in the era of dairy commercialization both for health of the animals as well as to improve the farm productivity. Although animal welfare scores, scales and modules have been developed and implemented at developed countries, the outreach of animal welfare and awareness about the same has not been given due importance in developing countries including India. In this context, the present research study was designed to make an attempt to find out the extent of adoption of dairy animal welfare practices (DAWPs) by the dairy farmers at field level with the help of Dairy Animal Welfare Index. For developing index, the previous studies conducted in the European Union related to animal welfare practices were taken as basic reference which consists of four principles good feeding, good healthcare, good housing and appropriate behaviour.

A perusal of Table 1 revealed that, with regard to'absence of prolonged hunger criteria of good feeding' as observed at field level during data collection, 21.47 per cent of the total dairy animals were found weak. Further, as expressed by dairy farmers in the study area, only 40.00 per cent of the farmers were providing 'adequate feed and fodder for maintaining health and vigour of dairy animal', 23.33 per cent of the farmers were 'following recommended feeding schedule and quantity', 85.00 per cent of the farmers were' allowing their new-born calves for suckling just after calving' and only 15.00 per cent of the farmers were' providing sufficient quantity of milk replacer along with calf starter.' In the case of second criterion, 'absence of prolonged thirst' only 35.00 per cent of the dairy farmers were 'providing adequate and clean drinking water to meet daily requirements of dairy animals', followed by 60.00 per cent of the farmers were 'arranging sufficient number of water points/troughs for easy access to water.' Further 80.83 per cent of the dairy farmers 'protected their dairy animals from feeding toxic plants and other harmful substances (i.e. plastic, garbage etc.)' and 86.67 per cent of the farmers were 'avoiding feedstuffs that can pose a risk to animal health (e.g. mould/fungus infested and spoiled feeds)'.This might be due to the care and concern for dairy animals and awareness about importance of providing good feed and clean water.

It is evident from the Table 2 that, 88.33 per cent of the dairy farmers were able to access veterinarians/other trained persons during parturition, followed by 65.33 per cent of the farmers ensured that the semen used for both A.I./Natural services was of genetically superior bulls (use of good quality semen) and only 45.83 per cent of the dairy farmers were following the gradual method of drying-off before next calving. At the same time 72.50 per cent of the dairy farmers also adopted the selection of dairy cows and buffaloes well-suited for the local agro-climatic conditions.

Good healthcare principle consists three criteria namely 'absence of injuries, absence of diseases and absence of pain induced by management practices', perusal of Table 3 indicated that, in the case of 'absence of injuries' as observed at field level in study area that, 92.63 per cent of the total animals were 'free from lameness (abnormality of movements)', 71.41 per cent of the animals were 'free from integument alterations on the skin of dairy animals', 96.70 per cent of the animals were 'free from teats and udder injuries' and 65.69 per cent of the total animals were 'free from claw and hoofs overgrowth.' In the case of second criteria that is 'absence of diseases', 87.80 per cent of the animals were 'free from abscesses', 75.73 per cent of the animals were 'free from discharges (nasal or ocular)' and only 85.77 per cent 'absence of the on-farm calf mortality' was observed in study area. The third criteria, 'absence of pain induced by management practices', as expressed by respondents 73.33 per cent of the farmers were 'not using disbudding/dehorning of animals', 95.83 per cent of the farmers were 'not using ear cutting' and no farmers were 'branding for identification of animals' in the study area.

Good housing principles is divided into three welfare criteria i.e. 'comfort around resting, thermal comfort and ease of movement', as results shown in the Table 4 indicated that, in the case of 'comfort around resting', 51.67 per cent of the farmers 'do not tie the animals continuously', 67.50 per cent of the farmers were 'cleaning/washing their animals on regular basis', 41.67 per cent of the farmers were able to 'provide suitable flooring for comfortable lying down, standing up, traction and insulation from the ground' and 78.33 per cent of the farmers provided 'levelled flooring with non-slippery material and provision of channels for urine/dung drainage'. In the case of a second criterion that is 'thermal comfort', about 45.00 per cent of the farmers were able to 'protect their animals from hot weather' by means of provision of fans, wet gunny bag and overhead water sprinklers. During cold weather 88.33 per cent of the farmers were protecting their animals by means of covering animal houses with thick and strong polythene sheets and gunny bags to prevent the chilled air entering into the cattle shed. In the case of third criteria that is 'ease of movement', only 37.50 per cent of the farmers were 'keeping animals free from tethering (animal is fastened by a rope to a central point, for confining to a specific area)' and only 22.08 per cent of the farmers were 'allowing their animals access to outdoor loafing or pasture area for grazing.'

Table 1. Adoption level of dairy farmers with regard to good feeding practices (n=120)

Sl. no.	Measurable practices (Observation/Response)	Percent
I	**Absence of prolonged hunger**	
1	Percentage of weak dairy animals in the farm	21.47
2	Provision of adequate feed and fodder for maintaining health and vigour	40.00
3	Feeding as per recommended schedule and quantity	23.33
4	Allowing of new-born calves for colostrum feeding just after calving	85.00
5	After separation from the mother, new-born calves must be fed with sufficient milk/milk replacer along with calf starter	15.00
II	**Absence of prolonged thirst**	
6	Provision of adequate and clean drinking water to meet daily requirements of dairy animals	35.00
7	Sufficient number of water points/troughs for easy access to water/ number of times	60.00
III	**Others**	
8	Protection of dairy animals from its feeding to toxic plants and other harmful substances (i.e. plastic, garbage etc.)	80.83
9	Feedstuffs that can pose a risk to animal health (e.g. mould/fungus infested and spoiled feeds) must be avoided.	86.67

Table 2. Adoption level of dairy farmers with regard to good breeding practices (n=120)

Sl. no.	Measurable practices (Observation/response)	Percent
I	**Selection of appropriate breeding practices**	
1	Selection of dairy cows and buffaloes well-suited for the local agro-climatic conditions	72.50
2	The semen used for both A.I./Natural services should be of genetically superior bulls (use of good quality semen)	65.83
3	Provision of necessary assistance by veterinarian/other trained person during parturition in case of difficulty	88.33
4	Practice of Drying-off in pregnant animals	45.83

Table 3. Adoption level of dairy farmers with regard to good healthcare practices (n=120)

Sl. no	Measurable practices (Observation/response)	Percent
I	**Absence of injuries**	
1	Lameness (abnormality of movement)	92.63
2	Integument alterations (hairless patches/lesions/swellings) on the skin of dairy animals	71.41
3	Teats and udder injuries in dairy animals	96.70
4	Overgrown claw and hoofs overgrowth	65.69
II	**Absence of diseases**	
5	Abscesses formation	87.80
6	Discharges (nasal, ocular)	75.73
7	Sick/dull animals in the herd/farm	88.18
8	On-farm calf mortality in the herd/farm	85.77
III	**Absence of pain induced by management practices**	
9	Disbudding/ dehorning of calves without local anaesthesia	73.33
10	Ear cutting of dairy animals for identification	95.83
11	Branding of animals without local anaesthesia	100.0
12	Use of equipments that are suitable for comfortable stock handling of animals	21.67

Table 4. Adoption level of dairy farmers with regard togood housing practices (n=120)

Sl. no.	Measurable practices (observation/response)	Percent
I	**Comfort around resting**	
1	The floor space for feeding, water troughs space available for each animal must be adequate for standing, resting, loafing, feeding, water intake and ventilation	27.50
2	Animals should not be kept tied continuously	51.67
3	Regular cleaning/washing of dairy animals are practiced	67.50
4	Floors in houses must allow for comfortable lying down, standing up, traction and insulation from the ground	41.67
5	Levelled flooring with non-slippery material and provision of channels for urine/dung drainage	78.33
II	**Thermal comfort**	
6	Methods followed to maintain micro-environment during hot/warmer conditions	45.00
7	Management practiced to protect animals during severe/chilled winter	88.33
III	**Ease of movement**	
8	Absence of tethering	37.50
9	Access to outdoor loafing or pasture area for grazing	22.08

Table 5. Adoption level of dairy farmers with regard to appropriate behaviour (n=120)

Sl. no.	Measurable practices (Observation/Response)	Percent
I	**Appropriate behaviour**	
1	Herd management practices that do not unnecessarily compromise the animals' resting and social behaviours	10.83
2	Expression of social behaviours (Agonistic behaviours such as aggressive and submissive behaviours)	37.50
3	Good human-animal relationship (approachable distance)	64.16
4	Skill of the farmers in handling the dairy animals	49.16

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

Sl. no.	Category	Frequency	Percent
1	Low (<0.45)	25	20.83
2	Medium (0.45-0.56)	67	55.83
3	High (>0.56)	28	23.34
	Total	120	100.00

In the case of appropriate behaviour, it was observed that 37.50 per cent of the total animals were observed to express the good social behaviour i.e. agonistic behaviour such as aggressive and submissive behaviour, 64.16 per cent of the farmers were able to approach the animal, which clearly indicates the good sign of human-animal relationships. It was also observed that, almost half of the dairy farmers (49.16%) showed good skills in handling of animals.

It could be inferred from the Table 6 that, the distribution of respondents according to their overall adoption of dairy animal welfare practices revealed that, more than half of the dairy farmers (55.83%)had medium level of adoption, whereas remaining 23.34 and 20.83 percent respondents had high and low levels of adoption, respectively. We can conclude that majority of the dairy farmers (79.17%) were coming under the medium to high level of adoption of animal welfare practices as they were closely bonded with their dairy animals and treated them with care and affection. Hence, majority of the farmers were adopting the dairy management practices which met the welfare of the dairy animals. The findings of the present study were in conformity with the finding of Otten et al. [12], Sharma et al. [13] and Mandi et al. [14].

4. CONCLUSION

From the study, it can be inferred that more than half of the respondents (55.83%) had medium levels of animal welfare practices, while 20.83% and the remaining 23.34% had low and high rates of animal welfare practices, respectively. In the case of limitations on the adoption of dairy animal welfare practices, lack of complete know-how on effective dairy management practices / animal welfare practices, lack of incentives, policy and program support and non-availability of timely veterinary services were the key constraints identified by the respondents in the order of priority. Hence, the present study concludes that, extension support system of state animal husbandry department needs to be strengthened, by training the extension personnel/veterinarians for effective dissemination of Animal Welfare Protocol (AWP) among the farmers. Further, the government should also come with policies and programmes that facilitates and motivates the farmers in adoption of Good Dairy Management Practices with much emphasis on animal welfare.

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

1. NDDB Annual Report 2018-19. National Dairy Development Board, India; 2019.
2. OIE. Animal welfare in terrestrial animal health code, Volume 1. World Organization for Animal Health (OIE), Paris. Section 7. 2008;235-319.
3. IDF. Guide to Good Animal Welfare in Dairy Production. International Dairy Federation (IDF), Brussels; 2008.
4. Broom DM. Animal welfare: concepts and measurement2. Journal of Animal Science. 1991;69(10):4167–4175. DOI: 10.2527/1991.69104167x
5. Sejian V, Lakritz J, Ezeji T, Lal R. Assessment methods and indicators of animal welfare. Asian Journal of Animal and Veterinary Advances. 2011;6(4):301-315.
6. Sinha RRK, Dutt T, Singh RR, Bhushan B, Singh M, Kumar S. Feeding and housing management practices of dairy animals in Uttar Pradesh. Indian Journal of Animal Sciences. 2009;79(8):829–833.
7. Ahmad S, Yaqoob M, Hashmi N, Zaman MA, Amjad MS. Farmers' attitude towards interventions regarding buffalo calf health care and management practices under field conditions. Pakistan. Vet. J. 2009;29 (3):125-128.
8. Patil AP, Gawande SH, Nande MP, Gobade MR. Constraints faced by the dairy farmers in Nagpur district while adopting animal management practices. Veterinary World. 2009;2(3):111-112.
9. Bergman MA, Richert RM, Cicconi-Hogan KM, Gamroth MJ, Schukken GH, Stiglbauer KE, Ruegg PL. Comparison of selected animal observations and management practices used to assess welfare of calves and adult dairy cows on organic and conventional dairy farms. Journal of Dairy Science. 2014;97(7): 4269-4280.
10. Cozzi G, Brscic M, Gottardo F. Main critical factors affecting the welfare of beef cattle and veal calves raised under intensive rearing systems in Italy: A review. Italian Journal of Animal Science. 2009;8(Suppl. 1):67-80.
11. Webster AJF. Farm Animal Welfare: the Five Freedoms and the Free Market. Vet. J. 161:229237; 2001.
12. Otten ND, Rousing T, Houe H, Thomsen PT, Sørensen JT. Comparison of animal welfare indices in dairy herds based on different sources of data. Animal Welfare. 2016;25(2):207-215.
13. Sharma A, Kennedy U, Schuetze C, Phillips CJ. The welfare of cows in Indian Shelters. Animals. 2019;9(4):172.
14. Mandi K, Subash S,Koloi S, Kumar R, Singh NP. Analysis of animal welfare practices adopted by Gaushalas (Cow-shelters) in Karnataka State. International Journal of Livestock Research. 2020;10 (2):20-29.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/57118