

RESEARCH ARTICLE

Adoption Status of Improved Animal Husbandry Practices and its Relationship with the Profile of Dairy Farmers in Kheda District of Gujarat

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ABSTRACT

This study was conducted to ascertain the extent of adoption of improved dairy husbandry practices and its relationship with the profile of the dairy farmers in the Kheda district of Gujarat. The study was undertaken in four randomly selected talukas of the district, from which 100 dairy farmers were selected randomly. The study revealed that the overall extent of adoption of improved animal husbandry practices in the study area was found to be about 62.78%. The overall highest adoption rate was for reproductive and healthcare management (81.40 and 81.33%) followed by feeding and calf management (77.00 and 62.00%), while the adoption of scientific milking and general management (37.60 and 37.30%) was the lowest. Education, landholding, annual income, and herd size of the dairy farmers had a highly significant ($p < 0.01$) positive relationship. In comparison, social participation and mass media of the dairy farmers had significant ($p < 0.05$) positive relationship with adoption of improved animal husbandry practices. However, family size, experience, and attitude towards dairy farming had a significant negative correlation with the improved animal husbandry practices. The independent variables considered in the present study explained about 38.20% variation ($r^2 = 0.38$) in adoption of the improved dairy husbandry practices.

Keywords: Adoption, Dairy farmers, Improved animal husbandry practices, Profile of the dairy farmers, Middle Gujarat.

Ind J of Vet Sci and Biotech (2020): 10.21887/ijvsbt.16.1.5

INTRODUCTION

India ranks first in the world with annual milk production of 187.5 million tonnes. Most of the milk is produced by animals reared by small and marginal farmers and landless laborers. Governments have also initiated several measures to increase the productivity of livestock, which has resulted in increasing the milk production significantly from the level of 102.6 million tonnes at the end of the 10th plan (2006-07) to 176.3 million tonnes in 2017-18, showing annual growth of 6.62%. The per capita availability of milk was an average of 394 gm per day in India and 626 gm per day in Gujarat (Anonymous, 2018). Gujarat shares 7.78% of India's total milk production with a production of 14.49 million tonnes and holds the 7th position in India. The average productivity of crossbred cows, indigenous cows, non-descript cows, indigenous buffaloes, and non-descript buffaloes in India is 7.61, 3.73, 2.41, 6.19, and 4.21 kg of milk per day, respectively (Anonymous, 2018). This is, however, lower as compared to per head productivity in other countries. The probable reasons for lower productivity are poor germplasm for milk production, inadequate feed, and fodder resources as well as inadequate healthcare facilities. Moreover, reasons like poor adoption and diffusion of new/improved animal husbandry technologies/practices and poor knowledge level of the dairy farmers are found responsible for lower production than the actual potential of the animal in India (Chander *et al.*, 2010). Adoption of scientific husbandry practices has great scope for improving overall productivity, profitability, and sustainability of a dairy farming enterprise. At the same time,

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How to cite this article: Divekar, B.S. & Trivedi, M.M. (2020). Adoption Status of Improved Animal Husbandry Practices and its Relationship with the Profile of Dairy Farmers in Kheda District of Gujarat. *Ind J Vet Sci and Biotech*, 16(1):22-26.

Source of support: Nil

Conflict of interest: None.

Submitted: 09/06/2020 **Accepted:** 16/06/2020 **Published:** 16/08/2020

the adoption of scientific practices is greatly affected by the socio-personal and economic characteristics of the farmers (Prajapati *et al.*, 2015). Hence this study was undertaken to know the adoption of scientific A.H. practices in dairy animals with reference to farmers profiles in Kheda district of Gujarat.

MATERIALS AND METHODS

The present investigation was carried out in the Kheda (Kaira) district of Gujarat state during the 2015. The district is located in middle Gujarat and was selected purposively because AMUL co-operative milk producers union is functioning in the Kheda district. For the present study, four talukas

from Kheda district and five villages from each taluka were randomly selected. Thus, a total of 20 villages were included in the study. From each village, five respondents/dairy farmers were randomly chosen. Thus, a total of 100 respondents /dairy farmers were selected for the investigation.

A pre-tested structured interview schedule was used to collect the relevant information, keeping in view the objectives of the study. The independent variables included the socio-economic characteristics, and dependent variables

included the extent of adoption of improved dairy husbandry practices by the farmers in the study area. To estimate the extent of adoption of improved animal husbandry practices, a total of 29 recommended dairy husbandry practices were detailed and divided into six significant aspects of husbandry practices (Table 1), viz., feeding management, milking management, health management, reproductive management, calf management and general management.

Table 1: Extent of adoption of improved animal husbandry practices by dairy farmers

Sr. No.	Practices	Respondents (n=100)
<i>Calf management (Adoption index)</i>		<i>62.00</i>
1	Feeding of colostrum to newborn calves within one hour of birth	56
2	Use of sterilized scissors/knife for cutting naval cord and application of tincture iodine on the naval cord	45
3	Disbudding of calves	52
4	Cleaning of calves after birth	77
5	Deworming of calves	80
<i>Feeding management (Adoption index)</i>		<i>77.00</i>
1	Feeding of chopped fodders to animals	65
2	Balanced concentrate mixture on the basis of milk production	75
3	Feeding of mineral mixture	85
4	Pregnancy allowances	74
5	Use of high yielding variety of fodder	86
<i>Milking management (Adoption index)</i>		<i>37.60</i>
1	Washing of hands before milking	70
2	Washing of udder and teats before milking	75
3	Full hand method of milking	23
4	Testing for mastitis detection	07
5	Post milking dipping of teats	13
<i>Healthcare management (Adoption index)</i>		<i>81.33</i>
1	Vaccination against infectious diseases (HS/FMD/Bruceellosis)	100
2	Prompt reporting of an outbreak of a contagious disease to the local veterinarian	68
3	Treatment of sick animals by the veterinary doctor only	96
4	Isolation of sick animals from the healthy ones in a separate house/ shed/place	74
5	Control measures of ectoparasites	81
6	Deworming of adult animals	69
<i>Reproduction management (Adoption index)</i>		<i>81.40</i>
1	Artificial insemination	95
2	Having the buffalo/cow served within 90 days after calving	49
3	Having the pregnancy diagnosis done between 60 to 90 days after service	75
4	Treatment of reproductive disease by a veterinarian	90
5	Proper disposal of placenta	98
<i>General management (Adoption index)</i>		<i>37.33</i>
1	Maintaining farm records	39
2	Purchasing animals from a reliable source based on scoring/ weightage on milk production	73
3	Purchasing animals after consulting veterinary officer	00

The adoption index is the degree to which a respondent actually adopts practices. Each of the adoption practice was given a score of 1 for scientifically “adopted” practices and 0 for scientifically “not adopted” practices. Thus, the minimum and maximum score a respondent could get was 0 and 29, respectively.

The adoption index was calculated through the following formula:

$$\text{Adoption index} = \frac{\text{Number of practices adopted}}{\text{Total number of practices}} \times 100$$

Following calculation of the extent of adoption of the improved animal husbandry practices of the individual farmer, the correlation coefficients (r) of the selected profile of the respondents were computed to see the relationship between profile and adoption of improved dairy husbandry practices.

RESULTS AND DISCUSSION

The overall and component-wise extent of adoption of the respondents in different aspects of improved animal husbandry practices in the study area is depicted in Table 1. The results indicated the extent of adoption of the recommended practices in six major aspects of dairy husbandry, viz., feeding, milking, reproductive, healthcare, calf management, and general management that were found to be 77.00, 37.60, 81.40, 81.33, 62.00 and 37.33 %, respectively. Overall, 62.78 % of the respondents adopted improved animal husbandry practices. A greater extent of adoption was observed in reproductive, healthcare and feeding management practices, while the lower extent of adoption was in milking and general management practices. The extent of adoption on calf management was found to be lower as compared to other major dairy management practices. Prajapati *et al.* (2015) reported a comparable adoption rate for calf management practices. Similarly, Rizwan *et al.* (2015) found a parallel adoption rate to that of the present study in breeding (reproduction) management practices.

Calf Management Practices

The majority of the respondents had adopted scientific calf management practices like cleaning of calves after birth, deworming of calves and feeding of colostrum to newborn calves within one hour of birth. Kumar and Mishra (2011) observed comparable adoption rates for cleaning of calves after birth, deworming of calves, colostrum feeding to calves, and practice of cutting & disinfection of the navel cord. However, Gadhavi *et al.* (2020) reported a higher adoption rate of colostrum feeding to newborn calves and disinfection of the navel cord.

Feeding Management Practices

It was observed that the majority of the respondents adopted practices like the use of a high yielding variety of

fodder, feeding of the mineral mixture, feeding of balanced concentrate mixture on the basis of milk production, pregnancy allowances to advance pregnant animals and feeding of chaffed fodder to the animals. Khatri *et al.* (2016) reported similar adoption rates for the above mentioned feeding practices. Jena *et al.* (2019) also reported a similar finding for feeding of the mineral mixture.

Milking Management Practices

The higher adoption rate was observed for the washing of udder & teats and washing of milker's hands before milking. Rathore *et al.* (2010), however, reported cent percent adoption for both these practices. In the present study, a very low adoption rate was found for full hand milking, post-milking dipping of teats, and testing for mastitis detection. Kumar and Mishra (2011) reported even less adoption (only 2.5 %) for the full hand method of milking. Traditionally since generations, farmers have adopted the knuckling method of hand milking due to swiftness in milking with lesser strain on muscles. The cost involved in dipping of teats and mastitis testing seems to be the reason for their lower adoption rate.

Healthcare Management Practices

Hundred percent of dairy farmers had adopted vaccination to prevent infectious diseases like HS, FMD, and Brucellosis. A higher adoption rate for vaccination practice was also reported in many earlier studies (Jena *et al.*, 2019). A total of 96% of respondents preferred services of veterinarians only for the treatment of their sick animals. This is attributed to a good network of veterinary health services of AMUL dairy in this district and veterinary dispensaries of the state Animal husbandry department. Further dairy farmers had adopted practices for control of ectoparasites, isolation of sick animals, and deworming of adult animals to a greater extent. A similar higher adoption rate was also reported for deworming practice by Jena *et al.* (2019) and isolation of sick animals by Kumar (2015).

Reproduction Management Practices

Proper disposal of the placenta, A.I. and treatment of reproductive diseases by veterinarian were the practices adopted by more than 95% of dairy farmers. Divekar and Trivedi (2017) also reported 82-95 % adoptions for A.I. in Kheda district. Similarly, the observation of Kumar (2015) regarding proper disposal of the placenta was in agreement with the present finding. Nearly 75 % of dairy farmers went for pregnancy diagnosis of their animals between 60 to 90 days of service. However, higher adoption rate for pregnancy diagnosis was reported earlier in Navsari district of South Gujarat (Prajapati *et al.*, 2015).

General Management Practices

The adoption rate for the purchase of animals from reliable sources was found higher, and maintenance of farm records was lower. Gadhavi *et al.* (2020) reported a higher adoption



Table 2: Relationship (*r*' value) between profiles of dairy farmers and their adoption regarding improved animal husbandry practices

Profile	<i>r</i> ' value
Age	-0.161
Education	0.461**
Caste	0.160
Family size	-0.265**
Experience	-0.348**
Social participation	0.198*
Landholding	0.290**
Annual income	0.347**
Herd size	0.321**
Economic motivation	-0.019
Risk orientation	0.182
Scientific orientation	-0.065
Achievement motivation	0.164
Attitude towards dairy farming	-0.216*
Mass media exposure	0.235*
Extension contact	-0.062

**p* <0.05, ** *p* <0.01.

rate for the maintenance of breeding records in South Gujarat. However, they did not get the animals checked by a veterinarian before purchase.

Relationship Between the Extent of Adoption of Improved Animal Husbandry Practices and Profile of Dairy Farmers

The correlations between extent of adoption of improved animal husbandry practices and profile of dairy farmers have been shown in Table 2. Among the profile of dairy farmers of Kheda district education, landholding, annual income, and herd size had positive and highly significant (*p* <0.01) association (*r* = 0.290 to 0.461), whereas social participation (*r* = 0.198) and mass media exposure (*r* = 0.237) had positive and significant (*p* <0.05) association with the adoption of improved animal husbandry practices. Further, family size and experience in dairy farming had negative and highly significant (*p* <0.01) association (*r* = -0.265 to -0.348), whereas attitude towards dairy farming had negative and significant (*p* <0.05) association (*r* = -0.216) with the adoption of improved animal husbandry practices. Further, the association of economic motivation, scientific orientation, and extension contact with improved animal husbandry practices were negligible (Table 2). The results were in agreement with Arora *et al.* (2006) regarding the level of education, Shyam Singh *et al.* (2013) regarding land holding, social participation, and family size, Durgga (2009) regarding annual income and Khokhar (2008) regarding mass media exposure and herd size. However, contradictory findings regarding attitude towards dairy farming and experience in dairy farming have

been reported by Sharma and Singh (2008) and Gamit *et al.* (2015), respectively.

The independent variables considered in the study explained only about 38.20% variation (*r*² =0.38) in adoption of the improved animal husbandry practices. However, there was about 62% unexplained variation, which could be attributed to variables that were not considered in this study, *viz.*, perception of the farmers toward the improved animal husbandry practices, affordability, and accessibility of the improved practices, willingness of the farmers to adopt the practices, comparative significance of the improved practices to farmers etc.

CONCLUSIONS

The study revealed that the overall extent of adoption of improved animal husbandry practices in the study area was only about 63%. Education, landholding, annual income, and herd size had highly significant (*p* <0.01) positive association, social participation, and mass media exposure had significant (*p* <0.05) positive association, whereas family size, experience, and attitude towards dairy farming had a significant negative correlation. In contrast, economic motivation, scientific orientation, and extension contact had a negligible correlation with the adoption of improved animal husbandry practices. These correlations revealed that farmers with better education, landholding, annual income, herd size, social participation, and mass media exposure of dairy farming could have a significant role in the adoption of improved animal husbandry practices.

ACKNOWLEDGEMENT

We thank the authorities of Anand Agricultural University, Anand, and the farmers for the facility and cooperation extended for this study.

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