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ADOPTION LEVEL OF IMPROVED DAIRY FARMING PRACTICES BY RESOURCE POOR DAIRY FARM HOUSEHOLDS

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ABSTRACT

The level of adoption of improved dairy farming practices would reveal the interest and enthusiasm of any individual farmer. A study was carried out in Haryana to determine the degree to which the chosen resource poor dairy farmers have adopted improved dairy farming practices. The purpose of the study was to ascertain how resource-poor dairy farmers were implementing new techniques. It was established what degree of acceptance the four main facets of dairy farming—breeding, feeding, healthcare, and management practices—had by resource-poor dairy producers. In the years 2021–2022, the research was carried out in the districts of Karnal, Jind, and Jhajhar in the state of Haryana, which correspond to three distinct agroclimatic zones. This was followed by selection of cluster of villages in each district with the predominance of resource poor dairy households and then 40 respondents randomly from each cluster. Thus, study constituted a sample size of 120 respondents. Data were collected using structured interview schedule which was later analysed by using frequency, percentage and regression. The findings revealed that majority of the respondents had medium level of adoption of breeding practices (54.17%), feeding practices (60.00%) and healthcare practices (57.50%). Majority of respondents (65.00%) possessed medium level of adoption of management practices too. Most of respondents (47.50%) belonged to medium level of overall adoption of improved dairy farming practices. About 54.6 per cent variance on dependent variable is due to the independent variables taken for the study. This implies the need for undertaking intensive education of resource poor farmers along with facilitation of critical inputs for profitable dairy farming.

Keywords: *adoption, resource poor farmers, dairy, households, cluster*

INTRODUCTION

Farm animals provide safe, healthier and nutritive food to the rearing farmers (Ponnusamy, 2006). Better adoption of improved dairy farming technologies could increase milk production with defined quality parameters. More than 86 per cent of marginal and small farmers are engaged in agriculture and allied sectors. They produce small quantity of milk which is of poor quality. They are practising subsistence farming. Empowering resource poor farmers is very vital because it will augment their income and harness the resources so that milk yield will increase and thereby strengthen the economy of the country (Ponnusamy and Padaria, 2021).

Dairy occupation is an integral part of rural agricultural economy (Thakur *et al.,* 2020; Mahammad et al., 2022). Resource poor farm families have less contact with the extension agents and their level of adoption for new technologies is also dismally low. Resources poor farmers are not able to harness the technologies because there is lacuna of sources and resources (Ponnusamy *et al,* 2021). Madke *et al*., (2006) conducted a study in the Bhandara district of Maharashtra to examine degree of adoption of scientific dairy farming practices. The results revealed that about 16 per cent of farmers followed the practices of grazing of animals and soaking of concentrates. Respondents had not used the tree leaves for fodder purpose and for silage preparation.

Quddus *et al.,* (2012) studied that adoption of improved technology was directly proportional to milk yield. Higher the level of adoption of technology, higher was the level of income and higher the yield of milk. For breeding purpose, 25 per cent of respondents used AI and 40 per cent of them had medium or high level of technology adoption. Rate of adoption by the literate farmers was more than the illiterate farmers. Cross breed technique was adopted by 35 per cent of the respondents.

Patel *et al.,* (2014) conducted study on knowledge and adoption of dairy farmers and founded that 62.14 per cent of dairy farm women had medium level of adoption. The respondents with high and low level of adoption were to the extent of 20.72 per cent and 17.14 per cent respectively. The mean adoption score was only 33.50.

Christian and Chauhan (2019) studied on participation of farmwoman in decision making process with respect to animal husbandry practices. The findings indicated that the majority of the dairy farm women in Kheda district's Vaso taluka are heavily involved in decision-making, particularly with relation to dairy products, sales and purchases, records, and day-to-day routine tasks like cleaning the shed, giving the animals a bath, milking the animals, and deciding how to use the milk profit.

Sharma *et al.,* (2015) studied the performance of women SHG members and stated that upon training on scientific dairy farming (SDF) and milk products preparation (MPP), they adopted the SDF practices and MPP technologies which have increased their income through sale of milk and indirectly saving of money by milk products prepared at home. Over the course of two to three years, an inventive model including fortnightly interactions between specialists and farm women using a group dynamics approach may not only bring about sustainable dairy farming but also responsible citizenship among the villagers.

It is widely acknowledged that better dairy farming practises in the dimensions of breeding, feeding, health care, and management must be adopted in order to increase production and productivity of dairy farming and make the dairy industry more profitable. There are significant inconsistencies between the adoption of better dairy farming practises by dairy farmers. This might be due to a lack of an effective method for disseminating knowledge, a lack of compatibility, complexity, and the inability to observe cutting-edge dairy farming practises (Mahammad et al., 2021). Farmers are unable to handle dairy farming practises properly in their fields as a result. It is crucial to ascertain the level of adoption for improved dairy farming practises among resource-poor dairy farmers in Haryana state.

OBJECTIVE

To know the adoption level of improved dairy farming practices by resource poor dairy farm households

METHODOLOGY

The study was conducted in the Haryana state. Three districts namely, Karnal, Jind, and Jhajjar were randomly selected representing three different Agro climatic zones in Haryana as classified by Haryana Kisan Aayog. From the selected districts, cluster of villages with the predominance of resource poor dairy households were selected in consultation with the Krishi Vigyan Kendra of respective districts. From each selected district, 40 respondents were selected randomly. Thus, study was conducted with 120 respondents. The dairy farmers having less than or equal to one ha of land and possession of herd size up to five dairy animals were selected wherein it was ensured that more than 50 per cent income was derived from dairy farming at the time of investigation as respondents for the study.

The parameters of feeding, breeding, health care, and management procedures were used to separate the chosen products. The respondent's answers were compared to each practice on a three-point adoption continuum, with values of 2, 1, and 0 for Always, Sometimes, and Never, respectively. Based on the mean and standard deviation of their scores in various adoption elements and total adoption of better dairy farming techniques, the respondents were divided into three adoption categories: low, medium, and high. The following equation was utilized to calculate the adoption index for several upgraded dairy farming techniques.

$$\text{Adoption Index} = \frac{\text{Score obtained by an individual}}{\text{Maximum obtainable score}} \times 100$$

RESULTS AND DISCUSSION

Table 1: Distribution of respondents based on adoption of breeding practices (n=120)

Practices	Full (2)	Partial (1)	Never (0)
Adoption of Breeding Practices			
a) Keeping a cross breed: cow/heifer	5 (4.2%)	43 (35.8%)	72 (60%)
b) Keeping watch on Oestrus cycle and heat symptoms of cow/buffaloes	58 (48.3%)	55 (45.8%)	7 (5.9%)
c) Practicing mating in cattle after 12-18 month of age	38 (31.7%)	5 (4.2%)	77 (64.1%)
d) Practicing A.I. in animals at proper time of heat	77 (64.2%)	40 (33.3%)	3 (2.5%)
e) Service the cow within 60-90 days after calving	44 (36.7%)	36 (30%)	40 (33.3%)
f) Practicing the pregnancy diagnosis between 45-120 days after A.I./natural service	25 (20.8%)	68 (56.7%)	27 (22.5%)

Figures in parentheses indicate percentage

Table 1 showed that 60.00 per cent respondents never adopted the keeping a cross breed cow/heifer, 35.8 per cent had partial adoption and 4.2 per cent regularly adopted the practices. It was found that 48.3 per cent of respondents regularly keep observing on oestrus cycle and heat symptoms of cow/buffaloes, while 45.8 per cent partially adopted the same and 5.9 per cent never adopted the practices. The results indicated that 31.7 per cent respondents always adopted the mating practices in cattle after 12-18 month of age, while 4.2 per cent partially and 64.1 per cent never adopted the practices. It is evident from the table that64.2 per cent respondents regularly adopted the A.I. practices in animals at the proper time of heat, while 33.3 per cent partially and 2.5 per cent never adopted the practices. Table further revealed that only 36.7 per cent respondents adopted the practice of service in the cow within 60-90 days after calving, while 30.00 per cent partially and 33.3 per cent never adopted the practices. A cursory look at a table revealed that 56.7% of respondents partially accepted the practice of identifying pregnancy between 45 and 120 days following A.I./natural treatment, whereas 22.5% adopted the procedures routinely and 22.5% never did. It is concluded that keeping of cross breed cow/heifer was less adopted by majority of resource poor respondents. Majority of respondents adopted A.I. practices for an animal at the proper time of heat due to awareness about benefits of A.I. practice like milk yield. Majority of respondents keep watching on oestrus cycle and heat symptoms of cow/buffaloes.

Table 2: Distribution of respondents based on adoption of feeding practices (n=120)

Practices	Full (2)	Partial (1)	Never (0)
a) Feeding colostrum to new born calves within 2-4 hours of birth	87 (72.5%)	26 (21.7%)	7 (5.8%)
b) Feeding colostrums continuously to new born calves up to 5th day of its birth	61 (50.8%)	48 (40%)	11 (9.2%)
c) Feeding concentrates mixture on the basis of milk production	18 (15%)	62 (51.6%)	40 (33.4%)
d) Providing green fodder to animals round the year	8 (6.7%)	35 (29.1%)	77 (64.2%)
e) Cultivating high yielding varieties seeds for fodder production	5 (4.2%)	18 (15%)	97 (80.8%)
f) Feeding pregnant cows with concentrate	46 (38.5%)	43 (35.7%)	31 (25.8%)

Figures in parentheses indicate percentage

Table 2 depicted that 72.50 per cent respondents fully adopted the practice of colostrum feeding to new born calves within 2-4 hours of birth, while 21.7 per cent partially and 5.8 per cent never adopted the practices. Table further revealed that 50.8 per cent respondents regularly adopted feeding colostrum continuously to new born calves up to 5th day of its birth, while 40.00 per cent partially and 9.2 per cent never adopted these practices. The table makes it clear that 51.60 per cent of respondents partially adopted the practice of feeding concentrates mixture on the basis of milk production, while only 15.00 per cent regularly and 33.4 per cent never adopted. A glance at a table showed that only 6.70 per cent regularly adopted the practice of providing green fodder to animals round the year, while 29.10 per cent partially and 64.20 per cent never adopted. It was found that 4.20 per cent respondents fully adopted the practice of cultivating high yielding varieties seeds for fodder production, while 15.00 per cent partially and 80.80 per cent never adopted. Table further revealed that 38.50 per cent respondents regularly adopted the feeding pregnant cows with concentrate, while 35.70 per cent partially and 25.80 percent never adopted. It can be concluded that the practice providing green fodder round the year was less adopted due to low land holding status by resource poor dairy respondents. Less adoption of the practice of cultivating high yielding varieties for fodder production by respondents was due to limited awareness and possession of smaller land size by resource poor respondents.

Table 3 showed that 60.00 per cent respondents partially adopted timely vaccination and regularly against the contagious disease especially *Hemorrhagic septicaemia*, Foot and Mouth Disease, Black Quarter, while 20.8 per cent fully adopted and19.20 per cent never adopted this practice. About 70.00 per cent of respondents partially adopted the segregation of animals suffering from contagious disease, while 6.7 per cent partially and 23.3 per cent never adopted this practice. A glance at a table showed that 65.8 per cent respondents were partially adopted practising parasiticide for prevention and control of ticks, mites etc., while 14.2 per cent fully adopted and 20.00 per cent never adopted.

Table 3 : Distribution of respondents based on adoption of healthcare practices (n=120)

Practices	Full (2)	Partial (1)	Never (0)
a) Practising vaccination timely and regularly against the contagious disease Especially H.S, FMD, B.Q	25 (20.8%)	72 (60%)	23 (19.2%)
b) Segregating the diseased animals suffering from contagious disease	8 (6.7%)	84 (70%)	28 (23.3%)
c) Practising parasiticide for prevention and control of ticks, mites etc.	17 (14.2%)	79 (65.8%)	24 (20%)
d) Practising deworming in calves for the prevention of endo-parasitic disease	37 (30.8%)	55 (45.8%)	28 (23.4%)
e) Burying the dead body if the animals die due to contagious disease	5 (4.2%)	23 (19.1%)	92 (76.7%)
f) Using only prescribed medicine by veterinarian	67 (55.8%)	32 (26.7%)	21 (17.5%)

Figures in parentheses indicate percentage

It is evident from the table 3 that 45.80 per cent respondents partially adopted the deworming in calves for the prevention of endo-parasitic disease, while 30.8 per cent fully adopted and 23.40 per cent never adopted. Table further revealed that 4.2 per cent respondents fully adopted the practice of burying the dead body if the animals die due to contagious disease, while 19.1 per cent partially adopted and 76.70 per cent never adopted. It was found that 55.8 per cent respondents fully adopted the practice of using only prescribed medicine by veterinarian, while 26.7 per cent partially adopted and 17.5 per cent never adopted. It is concluded that burying the dead body if the animals die due to contagious disease practices was less adopted due to lack of awareness about contagious disease among majority of respondents.

Table 4 : Distribution of respondents based on adoption of management practices (n=120)

Practices	Full (2)	Partial (1)	Never (0)
a) Providing clean and fresh water for drinking to animals	84 (70%)	36 (30%)	0 (0%)
b) Practising full hand method of milking i.e., without the use of thumb for milking the animals	63 (52.5%)	45 (37.5%)	12 (10%)
c) Maintaining cleanliness in the animal shed/houses	57 (47.5%)	45 (37.5%)	18 (15%)
d) Practising a dry period of about 60 days in cross breed cows	1 (0.9%)	47 (39.1%)	72 (60%)
e) Practising castration of male calves between one and two year of ages.	4 (3.3%)	46 (38.4%)	70 (58.3%)
f) Practising dehorning in calves at the age of about 7-31 days	2 (1.6%)	46 (38.34%)	72 (60%)

Figures in parentheses indicate percentage

The data in the Table 4 depicted that 70.00 per cent respondents had fully adopted the practice of providing clean and fresh water for drinking to animals, while rest (30.00%) partially adopted this practice. It has been found that 52.5 percent of respondents consistently used the whole hand method of milking, meaning they did not use their thumbs to milk the animals; 37.5 percent did so partially, and 12.00 percent never did. While provision of clean drinking is not a major issue for resource poor farmers, adoption of clean milk production practices poses formidable challenges due to lack of exposure to these practices by extension agencies. According to a table, 47.50 per cent of respondents had accepted the practice of keeping animal sheds and houses clean on a regular basis, while 37.50 per cent had only partially adopted it and 15.00 per cent had never done so. From the data, it is clear that 39.10 per cent of respondents only partially followed the practice of keeping cross-breed cows dry for 60 days, while 0.90 per cent fully accepted the practice and 60.00 per cent never did. This might be attributed mostly to a lack of understanding. It can be observed from the

table that 58.30 per cent respondents had never adopted the practice of castration of male calves between one and two years of ages, while 3.3 per cent fully adopted and 38.3 per cent partially adopted this practice. Results presented in the table 4.3.4 showed that only 1.6 per cent respondents fully adopted the practice of dehorning in calves at the age of about 7-31 days, while 38.40 per cent partially and 60.00 per cent never adopted this practice. It is concluded that practice of castration of male calves between one and two year of ages was less adopted by resource poor respondents due to limited ownership of cattle and cross breed cow/heifer by them. Similarly, dehorning in calves between the age of about 7-31 days was less adopted due to possession of a smaller number of cattle and cross breed cow/heifer.

Table 5 : Distribution of dairy farmers according to adoption level on improved dairy farming practices (n=120)

Practices	Category	Frequency	Percentage
Breeding	Low (<7)	37	30.83
(Range:5-11)	Medium (7-9)	65	54.17
(Mean:8.21)	High (>9)	18	15.00
Feeding	Low (<4)	27	22.50
(Range:3-10)	Medium (4-7)	72	60.00
(Mean:7.12)	High (>7)	21	17.50
Health care	Low (<5)	33	27.50
(Range:2-10)	Medium (5-8)	69	57.50
(Mean:6.85)	High (>8)	18	15.00
Management	Low (<5)	12	10.00
(Range:3-10)	Medium (5-7)	78	65.00
(Mean:6.61)	High (>7)	30	25.00
Overall adoption	Low (<25)	53	44.17
(Range:13-41)	Medium (25-33)	57	47.50
(Mean:26.4)	High (>33)	10	08.33

The findings displayed in Table 5 indicated that 47.50 percent of participants had an overall adoption level in the medium range (25–33). However, the overall adoption rate was low in 44.17 percent and high in 8.33 percent. Findings reveal the importance of intensive training, demonstration and exposure visit to research institutions and progressive farmers for gradually improving the adoption level.

Influence of selected independent variables on overall adoption of improved dairy farming practices by respondents

Multiple regression had been computed to delineate the contribution of independent variables on the dependent variable i.e., overall adoption of improved dairy farming practices. The findings are presented in the Table 6. It was found that out of ten independent variables only education, experience, land holding and herd size had highly significant contribution to overall adoption of improved dairy farming practices at 1 per cent level of signification.

From the Table 6 it could be concluded that 54.6 per cent variance on dependent variable is due to the independent variables taken for the study and rest 45.4 per cent might due to other unknown variables, which were not included in the study. With increase in the level of education, adoption level of improved dairy farming practices also increases which

Table 6 : Contribution of independent variables Vs Overall adoption of improved dairy farming practices by respondents

(n=120)

Sr. No.	Variables	Regression coefficient (b) values	"t" values
X_1	**Age**	-0.102	-.659
X_2	**Education**	0.464	5.437**
X_3	**Family size**	0.385	.622
X_4	**Experience**	0.373	3.861**
X_5	**Landholding**	0.228	2.778**
X_6	**Social participation**	2.541	1.941
X_7	**Herd size**	0.163	1.186**
X_8	**Milk consumption**	-0.216	-.965
X_9	**Milk sale**	0.011	.110
X_{10}	**Knowledge level**	-0.018	-.205
R^2= 0.546			
F stat = 16.73			
Y=-.102X1+.464X2 +.385X3+.373X4+.228X5+ 2.541X6+.163X7-.216X8+.011X9-.018X10			

**Significant at 1% level of significance

might be due to respondents possessing more awareness about improved dairy farming practices and understood the consequences of adoption. Similarly, adoption level increases with increase in years of experiences in dairy farming of the respondents which could be due to the fact that these farmers explore technologies which can increase the milk production. Adoption level of improved dairy farming practices also increases by increase in herd size which might be due to fear of loss of animals, so better management and health care practices adopted by resource poor dairy farmers can increase their incomes. Age was negatively related with adoption of improved dairy farming practices and was not significant. Although the respondents belong to resource poor category, if they are given the opportunities to cultivate fodder crops or even food crops, they could adopt improved dairy farming practices and thereby can increase the profitability. Milk sale did not emerge as a significant variable as their average milk production is also low which may not have promoted them to look for higher profit marketing channel. The regression analysis is suggesting that increasing herd size along with training and demonstration is likely to enhance the adoption and income level of resource poor household.

CONCLUSION

Adoption of suggested enhanced dairy production practices was moderate overall. Health-care techniques were not as widely adopted as other areas. Therefore, it is important to set up demonstrations and training programs on healthcare procedures in order to improve and preserve animal health.

CONFLICT OF INTEREST

No conflict of interest among researchers.

REFERENCES

Christian, B. M. and Chauhan, N. B. (2019) Participation of farmwoman in decision making process with respect to animal husbandry practices. *Gujarat Journal of Extension Education*, 30(2):137-144.

Ghasura, R. S., Rani, Durgga V. and Singh, R. R. (2024) Dairy farmers' views on overcoming barriers to adopting climate change adaptation strategies. *Gujarat Journal of Extension Education,* 37(2):195-200. https://doi.org/10.56572/gjoee.2024.37.2.0033.

Jadav, S. J., Patel, J. K. and Shah, P. H. (2023) A test to measure the knowledge level of dairy farmers about zoonotic diseases. *Gujarat Journal of Extension Education,* 36(1):75-84. https://doi.org/10.56572/gjoee.2023.36.1.0015.

Madke, P.K., Murkute, J.S., Upadhye, S.V., & Vedpathak, C.P. (2006). Adoption of scientific feeding practices by dairy farmers. *Indian Journal of Animal Research*, *40*(2),155-157.

Mahammad Shafi R. Sk, Chauhan N. B. and Vinaya Kumar H. M. (2021). Predictable characteristics of young dairy farmers in shaping their animal husbandry workability. *Guj. J. Ext. Edu.* 32 (2): 209-211.

Mahammad Shafi R. Sk, Chauhan N. B. and Vinaya Kumar H. M. (2022). Participation of young generation of practising dairy farmers in family dairy farming. *Guj. J. Ext. Edu.* 33 (2): 73-76. https://doi.org/10.56572/gjoee.2022.33.2.0014

Naik, R. M., Chaudhary, K. L. and Sharma, O. P. (2024) Professionalism in management of primary dairy cooperatives. *Gujarat Journal of Extension Education,* 37(1):178-182. https://doi.org/10.56572/gjoee.2024.37.1.0030.

Pandey, Saurabh, Ponnusamy, K. and Saini, Hemlata (2023) A test to measure knowledge of dairy framers about improved dairy farming practices. *Gujarat Journal of Extension Education,* 36(2):120-125. https://doi.org/10.56572/gjoee.2023.36.2.0022.

Patel, N. R., Gulkari, K. D. and Chawda, H. H. (2023) Knowledge of sons of dairy farmers regarding animal husbandry practices. *Gujarat Journal of Extension Education,* 36(2):152-156. https://doi.org/10.56572/gjoee.2023.36.2.0028.

Patel, R. N., Patel, V. T., & Prajapati, M. R. (2014). Attitude, knowledge and adoption level of dairy farm women towards dairy farming. *Gujarat Journal of Extension Education*, *25*(2), 138-139.

Ponnusamy K and Padaria R N. (2021). Research in agricultural extension: Review of its contribution and challenges. *Indian Journal of Agricultural Sciences* 91(5):659–665.

Ponnusamy K, Singh, V and Chakravarty R. (2021). Strategies to overcome the challenges in dairy extension. *Indian Journal of Animal Sciences*. 91(6): 430–437.

Ponnusamy K. (2006). Multidimensional analysis of integrated farming system in the coastal agro-eco system of Tamil Nadu. Ph.D. Thesis. NDRI (Deemed University), Karnal, Haryana.

Quddus, M. A. (2012). Adoption of dairy farming technologies by small farm holders: practices and constraints.

Bangladesh Journal of Animal Science, 41(2): 124-135.

Sharma P, Ponnusamy K and Kale R B Kale. (2015). Study on behavioural changes among women SHGs and their impact on adoption of scientific practices in dairying. *Indian Journal of Animal Research*. 46(6): 855-859.

Swami, Shreeja P., Patel, U. M. and Chaudhari, R. U. (2024) Knowledge of dairy farmers about periparturient diseases in bovine. *Gujarat Journal of Extension Education,* 37(1):188-191. https://doi.org/10.56572/gjoee.2024.37.1.0032.

Thakur, Nidhi B. and Patel, J. B. (2020) Decision making ability of farmwomen in agricultural development. *Gujarat Journal of Extension Education*, 31(2):123-126.

Usadadiya, Nirali H., Prajapati, R. R. and Parikh, N. L. (2023) Relationship between dairy farmers' characteristics and their adoption of clean milk practices. *Gujarat Journal of Extension Education,* 36(1):72-74. https://doi.org/10.56572/gjoee.2023.36.1.0014.

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