

Full Length Research Paper

Adoption of improved dairy husbandry practices and its relationship with the socio-economic characteristics of dairy farmers in Ada'a district of Oromia State, Ethiopia

Lemma Fita^{1*}, M. M. Trivedi² and Bekele Tassew¹

¹Ambo University, P. O. Box 19, Ambo, Ethiopia.

²Anand Agricultural University, Anand 388110, India.

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This study was conducted to ascertain the extent of adoption of improved dairy husbandry practices and its relationship with the socio-economic characteristics of the dairy farmers in Ada'a district of Oromia State, Ethiopia. It was undertaken in eight purposively selected peasant associations/kebeles of the district from which thirty dairy farmers were selected randomly. The study revealed that the overall extent of adoption of improved dairy husbandry practices in the study area was found to be about 50.44%. Mass media exposure, training on dairy farming and knowledge of the dairy farmers on dairy husbandry practices had positive and highly significant relationship with the adoption of improved dairy husbandry practices. Education status and experiences of the dairy farmers on dairy farming and participation of the dairy farmers in various dairy farming related organizations also had positive and significant relationship with adoption of the improved dairy husbandry practices. The independent variables considered in the present study explained about 34% variation ($r^2 = 0.34$) in adoption of the improved dairy husbandry practices.

Key words: Adoption, dairy farmers, husbandry practices, socio-economic characteristics.

INTRODUCTION

In developing countries like Ethiopia, where a greater proportion of the population lives in rural areas, and livestock provide the potential source of employment and in turn contribute to the national income, livestock production related technologies could be used as a potential means of increasing productivity and subsequently raising the incomes and living standard of the farmers. In recent years, the less developed countries have received increased attention on adoption of agricultural technologies (Makokha et al., 2007). Higher milk production can be achieved by proper implementation of the scientific dairy husbandry practices but many research evidences revealed that the cattle owners in Ethiopia are not keeping pace with the constantly changing improved technologies. Many farmers are still using traditional husbandry practices

which may be the cause of low production and productivity of the dairy animals. This low productivity could be attributed to, among other factors, the existence of millions of small-scale dairy producers who do not use improved dairy husbandry practices and for whom dairying is only a secondary enterprise (Ahmed et al., 2004).

The ability of the dairy farmers to generate more income from dairying largely depends on the effective adoption of improved dairy husbandry practices that lead to increase in productivity. The extent of adoption of these practices by the dairy farmers could be influenced by a set of factors including, socio-economic characteristics of the farmers (animal possession, education status of the farmers, extension contacts, experience in dairy farming, training on dairy farming, information and information sources utilization behavior) and lack of knowledge of the farmers regarding improved dairy husbandry practices. Thus, this study was designed to see the relationship between socio-economic characteristics of the dairy farmers and adoption

*Corresponding author. E-mail: yerulemma@gmail.com.

of improved dairy husbandry practices in Ada'a district of Oromia State, Ethiopia.

MATERIALS AND METHODS

Location of the study area

The study was conducted in Ada'a district of Oromia state, Ethiopia. Ada'a district is located at about 45 km away from Addis Ababa, the capital city of the country. The district lies between longitudes of 38° 51' to 39° 04' East and latitudes 8° 46' to 8° 59' North covering a land area of 1750 km². The majority of the land (90%) is plain highland ranging between 1600 to 2000 m above sea level. The climate of this district is sub-tropical and it receives 860 mm rainfall per annum. The overall mean minimum and maximum temperature of the area is 8 and 28°C, respectively.

Sampling techniques

Ada'a district was selected purposively because it is the potential area for milk production and the known area under Ada'a Dairy Cooperative of the country. The area is the most developed milk shed of the country, providing most of the dairy products to the market of Addis Ababa, the largest and most diversified market of Ethiopia. The present study was conducted in eight purposively selected peasant associations/kebeles. The peasant associations/kebeles were selected based on their milk production potential. Enumeration of all the households owing at least one milking cow in each of the selected peasant association and kebele was made with the help of the development agents in the respective selected areas. Then, from each selected peasant association/kebele, thirty dairy farmers were randomly selected making a total sample size of 240 respondents.

Data collection

A pre-tested structured questionnaire was used to collect the relevant information. The data were collected for four months (October, 2010 to January, 2011). The data collected included the socio-economic characteristics viz., age, education status, mass media exposure, extension contacts, organizational participation of the dairy farmers, training on dairy farming, experience on dairy farming and knowledge level of the farmers regarding improved dairy husbandry practices and extent of adoption of improved dairy husbandry practices of the farmers in the study area.

A teacher made test developed by Jha and Singh (1970) was employed to measure the extent of knowledge of the dairy farmers regarding improved dairy husbandry practices. The knowledge index was calculated using the following formula:

$$K_i = \frac{X_1 + X_2 + X_3 + \dots + X_n}{N} \times 100$$

where, K_i = Knowledge index, $X_1, X_2, X_3, \dots, X_n$ = total number of correct answers/obtained score and N = number of items in a test/maximum possible score.

To estimate the extent of adoption of improved dairy husbandry practices, various recommended dairy husbandry practices were detailed and divided into six major aspects of husbandry practices viz., selection and breeding, housing, feeding and watering, animal health and disease control, care and management and value addition. The scale contained thirty five practices, six practices from each of

selection and breeding, housing, feeding and watering, animal health and disease control, care and management and five practices from value addition. Corresponding to each of the practice, there were three columns representing 'continued adoption', 'discontinued after adoption' and 'not adopted' with weight of 3, 2 and 1, respectively. Accordingly, the minimum and maximum score a respondent could get on these scale were 35 and 105, respectively. A simple adoption index (Rao et al., 1992) was used to measure the extent of adoption of the improved dairy husbandry practices as:

$$\text{Adoption index} = \frac{\text{Total number of scores obtained}}{\text{Expected maximum score}} \times 100$$

After the extent of adoption of the improved dairy husbandry practices of the individual farmer was computed, the correlation coefficient (r) values of selected socio-economic characteristics of the respondents were computed to see the relationship between socio-economic characteristics and adoption of improved dairy husbandry practices in the study area.

RESULTS AND DISCUSSION

Extent of adoption of improved dairy husbandry practices by the farmers

The overall extent of adoption of the respondents in different aspects of dairy husbandry practices in the study area is depicted in Table 1. The results presented in Table 1 indicated the extent of adoption of the recommended practices in six major aspects of dairy husbandry viz., selection and breeding, housing, feeding and watering, animal health and disease control, care and management and value addition were found to be 67.85, 66.33, 39.51, 60.70, 47.99 and 14.25%, respectively. Higher extent of adoption was observed in breeding practices while lower extent of adoption was in value addition. The extent of adoption on feeding practices was found to be lower as compared to other major dairy management practices. This finding is contradicting with the findings of Madhukar and Ram (1996) that reported higher (83.49%) and lower (49.11%) extent of adoption for feeding and breeding practices, respectively.

The overall extent of adoption of improved dairy husbandry practices in the study area was found to be only 50.44% indicating the need to educate the dairy farmers on different aspects of dairy husbandry practices in general and value addition and feeding and watering practices of the dairy cows in particular. The present finding is in close conformity with the findings of Sandeep et al. (2006), Nchinda and Mendi (2008), Parmar et al. (2009), and Rathore et al. (2009) who had reported the overall adoption score of 54.14, 50.00, 53.00 and 54.90%, respectively.

Relationship between socio-economic characteristics and adoption level of the farmers

The ' r ' values of the considered socio-economic

Table 1. Overall extent of adoption of improved dairy husbandry practices by the farmers in the study area.

Practice	Adoption (%)	Rank
Selection and breeding	67.85	I
Housing	66.33	II
Feeding and watering	39.51	V
Animal health and disease control	60.70	III
Care and management	47.99	IV
Value addition	14.25	VI
Overall adoption (%)	50.44	

Table 2. Relationship between socio-economic characteristics and adoption of improved dairy husbandry practices.

S/N	Characteristics	'r' value
1	Age	0.04
2	Education status	0.17**
3	Organizational participation	0.14*
4	Mass media exposure	0.23***
5	Extension contacts	-0.06
6	Training on dairy farming	0.19***
7	Experience on dairy farming	0.17**
8	Knowledge on improved dairy husbandry practices	0.49***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

characteristics are presented in Table 2. The result showed that, out of the variables considered, age and extension contacts had no significant relationship with adoption. This result is in conformity with the findings of Ani et al. (2004), Arora et al. (2006) and Rathore et al. (2009) who had reported non-significant relationship of age with adoption of farm technologies but contradicting with the findings of Madhukar and Ram (1996), Ghosh et al. (2004), Hasan et al. (2008) and Karamjit et al. (2009) who had reported positive and significant relationship of age with adoption. A study conducted by Nicholson et al. (1998) revealed that, as the age of the respondents increased, the probability of adoption decreased. According to their report, a difference of twenty years in age resulted in a decrease in the probability of adoption by more than 28%. Previous studies of agricultural technology had also reported that older farmers may be more reluctant to adopt new technologies or practices (Nicholson et al., 1998).

Arora et al. (2006), Sandeep et al. (2006), Halakatti et al. (2007), Nichinda and Mendi (2008) and Karamjit et al. (2009) had reported positive and significant relationship of extension contacts with the adoption of scientific dairy husbandry practices which are not in conformity with the present finding. In the present study, extension contacts had negative and non-significant relationship with the adoption of improved dairy husbandry practices. This could

be attributed to the fact that farmers who have better educational status and better mass media exposure are having better adoption of improved husbandry practices in spite of having less contact with the extension agents.

Mass media exposure, training on dairy farming and knowledge of the dairy farmers on dairy husbandry practices had positive and highly significant relationship with the adoption of scientific dairy husbandry practices ($P < 0.001$). These findings are in agreement with the findings of Ghosh et al. (2004), Rahelizatovo et al. (2004), Arora et al. (2006) and Halakatti et al. (2007).

Education status and experiences of the dairy farmers on dairy farming had also positive and significant relationship with adoption of the scientific dairy husbandry practices ($P < 0.01$) (Table 2). These findings are in agreement with the findings of Rahelizatovo et al. (2004), Sandeep et al. (2006), Halakatti et al. (2007), Hasan et al. (2008), Nichinda and Mendi (2008) and Karamjit et al. (2009). The significant relationships of education level and experience of the dairy farmers with adoption level imply that dairy farmers with higher education level and better experience adopt the improved dairy husbandry practices more than the less or non-educated/experienced ones. According to Ani et al. (2004), the length of farming experience among the respondents was not an important determinant of adoption technologies. They have also observed that farmers who have been long in the business are usually older, less educated and are reluctant to change than the new entrants. Participation of dairy farmers in various dairy farming related organizations had significant effect on adoption of improved dairy husbandry practices.

The independent variables considered in the present study including age, education status, organizational participation, mass media exposure, extension contact, training on dairy farming, experience on dairy farming and knowledge of the dairy farmers on improved dairy husbandry practices explained only about 34% variation ($r^2 = 0.34$) in adoption of the improved dairy husbandry practices. However, there is about 66% unexplained variation which could be attributed to variables that were not considered in this study viz., perception of the farmers toward the improved 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.

Conclusions

The study revealed that the overall extent of adoption of improved dairy husbandry practices in the study area was found to be only about 50.44%. Mass media exposure, training on dairy farming and knowledge of the dairy farmers on dairy husbandry practices had positive and highly significant ($P < 0.001$) relationship with the adoption of improved dairy husbandry practices. Education status and experiences of the dairy farmers on dairy farming had

also positive and highly significant ($P < 0.01$) relationship with adoption of the improved dairy husbandry practices. The positive and significant relationships of the considered socio-personal characteristics with adoption reveal that farmers with better mass media exposure, better level of education and better participation in various dairy organizations and training of dairy farming which could have a significant role in explaining the knowledge level, have better adoption of improved dairy husbandry practices.

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