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Correlates of adoption of dairy innovations among dairy farmers

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Abstract

Dairy sector plays a pivotal role in improving the nutritional standards of people, generating employment opportunities, improving rural economy besides fulfilling consumer demands. In spite of its huge contribution to the rural economy not much of improved technologies were adopted by the farmers due to various reasons like lack of knowledge, inappropriateness of technology, poor extension services, resistance to change etc. This study is an effort intended to explore the variables contributing to the adoption of dairy innovations and significant variation explained by the selected variables in the adoption process. Three districts from all the three regions of Andhra Pradesh were selected purposively and from each district, three mandals and six villages were selected based on farmers ranking in adoption of innovations. Thus, 360 farmers were selected from total 18 villages. Correlation, multiple regression and step down multiple regression were carried out to identify the independent variables that accounted for variation in adoption levels of the respondents. The step down multiple regression analysis done at last step for prediction of influence of independent variables on rate of adoption revealed that, experience, herd size, milk production, income, economic orientation and information seeking behaviour were significant ($P \leq 0.01$) in positive direction while age is significant ($P \leq 0.01$) in negative direction. All these variables were crucial in explaining the variation in adoption among dairy farmers.

Keywords: Adoption, correlation, multiple regression, step down multiple regression

Introduction

Dairy sector plays a crucial role in sustaining the livelihood of small and marginal farmers. It not only contributes to the small farmers income, but also acts as best insurance against natural calamities. Dairy development in India plays a major role in improving the nutritional standards of people, generating employment opportunities and improving rural economy besides fulfilling consumer demands. There is an urgent need to enhance productivity of dairy animals by promoting adoption of scientific practices. The farmer himself is one of the main actors in the adoption or rejection of technology. But the lack of adoption of scientific practices itself is cited as a major stumbling block in achieving a faster growth rate in milk production. (Singh.S *et al.*, 2010) [5]. It is often conjectured that not more than 30 per cent of the improved technologies released by research organizations are adopted by the farmers. The huge gap between recommended and adopted practices has been attributed to a variety of factors like lack of knowledge, inappropriateness of technology, poor extension services, resistance to change etc. The present study is an effort in this direction, intended to explore the variables contributing to the adoption of dairy innovations and significant variation explained by the selected variables in the adoption process.

Methodology

The present study was carried out purposively in all three regions i.e., North Coastal, Coastal and Rayalaseema regions of Andhra Pradesh as the investigator and the technologies generated by the University belong to the same area. Based on the highest cattle population and best rank in adoption of recommended dairy innovations three districts namely Visakhapatnam, Krishna and Chittoor were selected from each region respectively. Three mandals from each district and two villages from each mandal, i.e., 6 villages from each district totaling to 18 villages were selected through simple random sampling. From each village 20 dairy farmers who rank first in adoption of dairy innovations were selected and finally 360 respondents constituted the sample for the study. The relationship between independent variables with adoption was found out by computing the correlation coefficient (r).

The multiple regression coefficient 'R' is the highest possible correlation between least square of the independent variables and the observed dependent variable and R^2 is the portion of the variance in the criterion variable and the significance of R^2 was tested with the help of F-test. Step down regression analysis was done to identify the independent variables that accounted for variation in adoption levels of the respondents.

Results

It was observed from the results that, the variables land

holding, experience, herd size, milk production, income, decision making ability, economic orientation, perception, information seeking behavior and communication channels were positively and significantly related with adoption while the variable age is negatively and significantly correlated with adoption of dairy innovations at 0.01 level of probability. The variables gender, education, innovativeness, scientific orientation, attitude and communication channels were non-significantly correlated with adoption.

Relational analysis of adoption and profile characteristics of dairy farmers

Table 1: Relation between adoption of dairy innovations and profile characteristics of dairy farmers.

S. No.	Independent variables	Correlation coefficient r-value
1.	Age	-0.286**
2.	Gender	0.138 ^{NS}
3.	Education	0.215 ^{NS}
4.	Land holding	0.366*
5.	Experience	0.328**
6.	Herd size	0.265**
7.	Milk production	0.304**
8.	Income	0.480**
9.	Innovativeness	0.198 ^{NS}
10.	Decision making ability	0.389**
11.	Risk bearing ability	0.182 ^{NS}
12.	Economic orientation	0.333**
13.	Scientific orientation	0.178 ^{NS}
14.	Perception	0.325**
15.	Attitude	0.282 ^{NS}
16.	Information seeking behaviour	0.392**
17.	Communication channels	0.465**

* Correlation is significant at 0.05 level

** Correlation is significant at 0.01 level

Prediction of contribution of independent variables on adoption of dairy innovations

To predict the contribution of independent variables on adoption, multiple regression analysis was carried out.

Further, Step down regression analysis was done to identify the independent variables that accounted for variation in adoption levels of the respondents.

Table 2: Multiple linear regression analysis of independent variables with adoption

S. No.	Variables	Regression coefficient (b)	SER	t value
1.	Age	-0.895	0.285	-2.438**
2.	Gender	0.058	0.160	0.175
3.	Education	0.005	0.137	0.072
4.	Land holding	0.935	0.236	1.813 ^{NS}
5.	Experience	3.916	0.893	2.787**
6.	Herd size	-0.131	0.046	-0.875
7.	Milk production	0.147	0.056	1.339 ^{NS}
8.	Income	0.550	0.186	3.777**
9.	Innovativeness	0.705	0.283	0.928
10.	Decision making ability	0.329	0.089	0.497**
11.	Risk bearing ability	0.690	0.287	2.407**
12.	Economic orientation	4.105	2.658	3.885**
13.	Scientific orientation	2.342	1.235	1.818
14.	Perception	0.887	0.234	0.361
15.	Attitude	0.229	0.013	1.446
16.	Information seeking behavior	1.088	0.372	3.567**
17.	Communication channels	1.252	1.087	2.129

$R^2 = 0.587$, F value = 12.22**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

The results of multiple linear regression for prediction of selected profile characteristics that contribute to the variation in the adoption of innovations were presented in Table 2.

Careful observation of results indicated that, the variables experience, income, risk bearing ability, information seeking behaviour had shown positive and significant regression

coefficients while the variable age had shown significant and negative regression coefficient at 1 per cent level of probability. The variable risk bearing ability had shown positive and significant regression coefficient at 5 per cent level of probability. The variables gender, education, land holding, herd size, milk production, innovations, decision making ability, scientific orientation perception and attitude had non-significant regression coefficients with adoption of innovations.

The R^2 value (0.587) indicated that all the independent variables put together explained variation in adoption of dairy farmers to an extent of 58.7 per cent. The computed F-value (12.22) was found to be highly significant. Based on R^2 and

the test, null hypothesis was rejected and the original proposition that the 17 independent variables explained a significant amount of variation in the adoption of various dairy innovations. Step down regression analysis was done to identify the independent variables that accounted for variation in adoption levels of the respondents.

Prediction of independent variables which contributed for maximum variation on adoption levels of dairy farmers

Step down regression analysis was done to identify the independent variables that accounted for variation in adoption levels of the respondents.

Table 3: Step down multiple regression analysis for predicting the influence of selected profile characteristics with adoption of dairy farmers

S. No.	Variables	Regression coefficient (b)	t-value
1.	Age	-3.218	-4.208**
2.	Experience	0.049	3.870**
3.	Herd size	2.741	43.549**
4.	Milk production	1.673	2.172*
5.	Income	0.049	3.128**
6.	Risk bearing ability	0.0872	0.1825
7.	Economic orientation	1.312	3.374**
8.	Information seeking behaviour	0.594	3.184**

$R^2 = 0.564$, F value = 11.584**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

The results of Table 3 confirmed that eight variables significantly contributed to 56.4 per cent variation in adoption of innovations by dairy farmers. The variance ratio (11.584) was found to be significant at 1% level of probability. The variables experience, herd size, income, economic orientation and income seeking behavior contributed positively and significantly while the variable age contributed negatively and significantly to adoption at 1% level of probability. The variable milk production contributed positively and significantly at 5% level of probability. The variable risk bearing ability contributed non-significantly to the variation in adoption of dairy innovations.

Discussion

Multiple linear regression analysis presented in Table 2, showed that the variables experience, income, decision making ability, economic orientation, information seeking behaviour were found to have positive and significant coefficients at 1% level of probability. The value of R^2 (0.587) indicated that all the independent variables put together explained the variation in adoption of the innovations to an extent of 58.7 per cent. The computed F-value (12.22) was significant at 1% level.

The farmers in the present study had an average experience of 15 years which increased their accessibility to various innovations in the dairy farming sector. As the real time experience plays a crucial role in decision making process, the innovations with relative advantage and net profitability were chosen and adopted by them. The economic well being of any farm house hold depends on income which is a key component in technology adoption and other production decisions. Since most of the innovations suggested in the present study involve simple production and technology aspects, income had shown a positive and significant correlation. The findings gained the support of Rathi N (2015) [4].

Farmers with rich experience, sound knowledge and good

economic orientation advocated rationality in decision making and adopted useful technologies from moderate to high extent. Majority of farmers were prepared to accept the element of risk to an optimal extent which resulted positive regression with risk bearing ability (Bashiru M *et al.*, 2014) [2]. Economic orientation is essential for any farmer to enhance profitability and sustainability of his enterprise (Amitendu *et al.*, 2014) [1]. The adoption of scientific innovations by the respondents is an indication that the farmers are moving towards profit maximization which is essential for progress of dairy enterprise. Since majority of the farmers in the present study had medium economic and scientific orientation, they had inquisitiveness to enquire on the practices yielding higher returns through all the available sources of information thereby adopting the best suitable recommendations (Jeelani R *et al.*, 2015) [3].

The step down multiple regression analysis done at last step for prediction of influence of independent variables on rate of adoption revealed that, experience, herd size, milk production, income, economic orientation and information seeking behaviour were significant ($P \leq 0.01$) in positive direction while age is significant ($P \leq 0.01$) in negative direction. Risk bearing ability had shown non-significant relation in positive direction. All these variables explained 56.4 per cent variation whose F-value was significant (11.584) at 1 per cent level of probability. This implied that all these variables were crucial in explaining the variation in rate of adoption among dairy farmers.

Conclusion

The study reveals that experience, herd size, milk production, income, economic orientation and information seeking behavior of the respondents should be taken into consideration while formulating dairy developmental programmes. Farmers must be empowered to adopt good innovations that improve their production through skill trainings and capacity building. Efforts shall be made to

establish linkages to farmers with information sources on dairy innovations, new technologies and market related information such as demand and supply prices.

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