

*Original Research***Adoption of Vaccination, Deworming and Artificial Insemination Practices by the Farmers of Bareilly district of Uttar Pradesh and Solapur district of Maharashtra****Hari, R.^{1*}, Kolekar, D. V.², Shyam, J.³, Sharma, N. K.⁴ and Patel, R. K.¹**¹Assistant Professor, Department of Veterinary & Animal Husbandry Extension, C.V.Sc. & A.H., Rewa, N.D.V.S.U, Jabalpur, Madhya Pradesh, INDIA²Scientist, ATARI, Bengaluru INDIA³Veterinary Officer, Animal Husbandry & Veterinary Department, Assam INDIA⁴Assistant Professor, Department of Veterinary & Animal Husbandry Extension, C.V.Sc. & A.H., Bikaner, R.A.J.U.V.A.S, Rajasthan, INDIA***Corresponding author:** haript84@gmail.com

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Abstract

Livestock farming provides supplementary income to rural livelihood. The productivity of the animals depends primarily upon the scientific farming methods adopted by the farmers. The present research identifies some of the managerial practices adopted by the farmers from Bareilly district of Uttar Pradesh and Solapur district of Maharashtra. The study population was dairy farmers who were selected by applying random sampling technique. The data were collected through interview schedule from 80 farmers of the study area. Majority of the respondents belonged to middle age group (65%). Majorities (96.25%) of the respondents were male respondents and majority (43.75%) had primary level of education. Family size for majority of the respondents belonged to medium size group (75%). Majority of the respondents had medium level (57.5%) of annual income. Majority of the respondents had medium size of land holdings (43.75%). 100 per cent of the respondents occupation was Agriculture and Animal husbandry and herd size of majority of the respondents was large (50%). 68.75 percent of the respondents adopted vaccination practices against FMD. 50 percent of the respondents adopted vaccination against HS whereas 63.75 percent of the respondents adopted deworming practices followed by 80 percent of the respondents who adopted A.I. practices. Awareness about the technology or its benefits was the prime reason for adoption of vaccination, deworming and A.I. technologies. Unprofitable technology was the major reason for non adoption of vaccination, deworming and A.I. technologies.

Key words: Artificial Insemination, Deworming, Livestock Farmers, Vaccination

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Introduction

Adoption of any improved technology involves a process in which awareness is created, attitudes are changed and favourable conditions for adoption are provided (Ghosh *et al.*, 2008). Knowledge of a farmer about various animal husbandry practices such as breeding, feeding and management of animals determines largely the success or failure of his enterprise. To enhance the sustainability of production potential of milch animals we need to prevent cattle from getting infected by various diseases. For this purpose it is essential that due emphasis is given on preventive strategies, in terms of dissemination of disease control measures, *viz.* vaccination and deworming. Artificial insemination on the other hand has several advantages over the natural service as it is economic, genetic improvement of the animals can be done in a relatively shorter period of time and elimination of non-descript animals can be done in a relatively shorter interval of time. Despite having these advantages the adoption rate for artificial insemination is still less due to misconceptions and doubts regarding A.I., poor detection of heat by the farmers, cost factors etc.

The adoption behaviour of the dairy farmers depends on education, knowledge, attitude, risk orientation and innovation proneness (Bhople and Thakare, 1994; Kunzru and Tripathi, 1994). In other words, adoption is a multi-dimensional event and a wide range of factors (such as attitudes, beliefs, perceptions, personal characteristics and so on) may affect it. Considering these factors, a study was carried out to determine the adoption behaviour of the farmers relating to vaccination, deworming and AI practices.

Materials and Methods

The present study was conducted in Bareilly District of Uttar Pradesh and Solapur district of Maharashtra. A sample of 80 people was taken by the snowball technique, for the survey. They were interviewed using a previously validated semi-structured questionnaire on adoption of vaccination, artificial insemination (A.I.) and deworming practices. The respondents were then classified as adopters, discontinued adopters and non-adopters of a particular practice of technology. The adopters were again classified as early and late adopters. For this classification each farmer (adopter farmers) was asked the year in which he had adopted the technology each technology adoption by each was found out and the median year for each technology was found out. The adopters adopting the technology before median year were considered as early adopters and farmers who adopted after median years were considered as late adopters. The respondents were asked to elicit reasons which they perceived to be important for the adoption, non-adoption and discontinued adoption of technologies. They were also asked about the consequence of adoption of these innovations. The respondents were asked to rate each of the reasons for their discontinued adoption/ non-adoption on a three-point scale - relevant (score of 2), not so relevant (score of 1) and irrelevant (score of 0). The scores for each of the reasons were aggregated across all the respondents.

and mean score for each reason were obtained. The reasons for adoption, non-adoption, discontinued adoption and consequences of adoption were then ranked on the basis of the mean scores. Statistical analyses were done using mean and percentage.

Results and Discussion

Socio Economic Profile

Data in Table 1 revealed that majority of the respondents were of middle age group in both the states (65%) followed by young (18.75%) and old age group (16.25%). Majority of the respondents were male respondents (96.25%). In case of education, data in Table 1 revealed that majority of the respondents had primary level of education (43.75%) followed by high school level of education (30%).

Table 1: Socio economic profile of the respondents

Profile Characteristics	Bareilly (U.P.)	Solapur (Maharashtra)	Pooled
Age			
Young(18-30Yrs)	6(15)	9(22.5)	15(18.75)
Middle(30-45Yrs)	25(62.5)	27(67.5)	52(65)
Old(>45)	9(22.5)	4(10)	13(16.25)
Sex			
Male	39(97.5)	38(95)	77(96.25)
Female	1(2.5)	2(5)	3(3.75)
Education			
Illiterate	6(15)	4(10)	10(12.5)
Primary	16(40)	19(47.5)	35(43.75)
High school	11(27.5)	13(32.5)	24(30)
Intermediate	5(12.5)	3(7.5)	8(10)
Graduate	2(5)	1(2.5)	3(3.75)
Religion			
Hindu	37(92.5)	38(95)	75(93.75)
Muslim	3(7.5)	2(5)	5(6.25)
Family size			
Small(up to 4 members)	2(5)	4(10)	6(7.5)
Medium(4-8 members)	29(72.5)	31(77.5)	60(75)
Large(>8 members)	9(22.5)	5(12.5)	14(17.5)
Annual income			
Low(up to Rs.75000)	17(42.5)	7(17.5)	24(30)
Medium(Rs.75000-1.5lakhs)	18(45)	28(70)	46(57.5)
High(Above Rs.1.5lakhs)	5(12.5)	5(12.5)	10(12.5)
Land size			
Landless	0(0)	0(0)	0(0)
Marginal	6(15)	2(5)	8(10)
Small	14(35)	13(32.5)	27(33.75)
Medium	13(32.5)	22(55)	35(43.75)
Large	7(1.5)	3(7.5)	10(12.5)
Occupation			
Primary (Agriculture & A.H.)	40(100)	40(100)	80(100)
Subsidiary	0(0)	0(0)	0(0)
Herd size			
Large(Above 3.38)	17(42.5)	23(57.5)	40(50)
Medium(1.79-3.38)	13(32.5)	11(27.5)	24(30)
Small(below 1.79 cattle equivalent)	10(25)	6(15)	16(20)

Data in the parenthesis indicates %

Majority of the respondents belonged to Hindu religion group (93.75). For family size majority of the respondents belonged to medium size family (75%) followed by large size (17.5%). Data in Table 1 revealed that majority of the respondents had medium level (57.5%) of annual income followed by high income group (12.5%). Majority of the respondents had medium size of land holdings (43.75%) followed by small (33.75) and large size (12.5%) land holdings. In perusal of data in Table 1, it was found that 100 per cent of the respondents' had agriculture and animal husbandry as their primary occupation. Herd size of majority of the respondents were large (50%) followed by Medium (30%) and small size (20%).

Cosmopolitaness

In perusal of the data in Table 2, it was found that, farmers in Maharashtra had cent per cent contacts with the veterinary centre compared to the farmers in Uttar Pradesh which revealed only 15 per cent of contacts with the veterinary centre. Overall the pooled data revealed that 57.5 percent of the farmers had contacts with the veterinary centres.

Table 2: Cosmopolitaness

Sources	Bareilly (U.P.)	Solapur (Maharashtra)	Pooled
Veterinary centre	6(15)	40(100)	46(57.5)
Krishi Vigyan Kendra	0(0)	3(7.5)	3(3.75)
Other Veterinary Institutes	0(0)	0(0)	0(0)
Block Office	0(0)	0(0)	0(0)
Other Government Offices	0(0)	0(0)	0(0)

Data in the parenthesis indicates %

Source of Information

In perusal of Table 3 it was found that, 100 percent of the farmers in Maharashtra received information from veterinary centres whereas it was only 15 per cent in case of Uttar Pradesh. Para vets were an important source of information for both the states (100%). In case of pooled data 57.5 percent of the respondents stated that they received information from veterinary centres.

Table 3: Sources of information

Sources	Bareilly (U.P.)	Solapur (Maharashtra)	Pooled
Veterinary centres	6(15)	40(100)	46(57.5)
Other government offices	0(0)	0(0)	0(0)
Paravets	40(100)	40(100)	80(100)
Neighbours	13(32.5)	18(45)	31(38.75)
News paper	3(7.5)	7(17.5)	10(12.5)
Radio	3(7.5)	7(17.5)	10(12.5)
T.V	3(7.5)	7(17.5)	10(12.5)

Data in the parenthesis indicates %

Adoption of Various Practices

In perusal of Table 4, regarding adoption of various practices by farmers of both districts, it was found that, 68.75 percent of the respondents adopted vaccination practices against FMD, followed by 10 percent who discontinued after adopting vaccination. 21.25 percent of the respondents did not adopt vaccination against FMD. 50 percent of the respondents adopted vaccination against HS whereas 42.5 percent did not adopt vaccination against HS. Regarding vaccination against BQ majority of the respondents 72.5 percent did not adopted vaccination against it. 63.75 percent of the respondents adopted deworming practices followed by 80 percent of the respondents who adopted A.I. practices. The findings are in contradiction to the findings by Yadav *et al.* (2009).

Table 4: Adoption of various practices

Practices	Bareilly (U. P.)				Solapur (Maharashtra)			
	Adopters	Discontinued adopter	Non adopters	Median year for adopters	Adopters	Discontinued adopter	Non adopters	Median year for adopters*
Vaccination for FMD	22(55)	6(15)	12(30)	1997	33(82.5)	2(5)	5(12.5)	1995
Vaccination for HS	16(40)	4(10)	20(50)	2002	24(60)	2(5)	14(35)	2000
Vaccination for BQ	8(20)	0(0)	32(80)	2005	14(35)	0(0)	26(65)	2003
Deworming	19(47.5)	4(10)	17(42.5)	1997	32(80)	2(5)	6(15)	1995
A.I.	24(60)	6(15)	10(25)	1997	40(100)	0(0)	0(0)	1992

Data in the parenthesis indicates %

Practices	Pooled data for two districts			
	Adopters	Discontinued adopter	Non adopters	Median year for adopters*
Vaccination for FMD	55(68.75)	8(10)	17(21.25)	1996
Vaccination for HS	40(50)	6(7.5)	34(42.5)	2001
Vaccination for BQ	22(27.5)	0(0)	58(72.5)	2004
Deworming	51(63.75)	6(7.5)	23(28.75)	1996
A.I.	64(80)	6(7.5)	10(12.5)	1994

Data in the parenthesis indicates %

Division of Adopters

In perusal of Table 5, it was found that in Maharashtra state 82.5 percent of the respondents were adopters for FMD, 60 percent for H.S., 35 percent for B.Q., 80 percent for deworming and 100 percent for A.I. practices compared to 55 percent in Uttar Pradesh in case of vaccination for FMD, 40 percent for HS, 20 percent for BQ, 47.5 percent for deworming and 60 percent for A.I. practices. This indicates that there is regional difference in the adoption of practices in India. The current study being conducted in U.P and Maharashtra, the reasons may be attributed to the higher literacy rate of the Maharashtra compared to Uttar Pradesh. In case of the pooled data majority of the respondents 68.75 percent were adopters against

FMD, followed by 50 percent against HS, 27.5 in case of BQ, 63.75 percent for deworming and 80 percent in case of A.I. Practices. The results obtained in Maharashtra were contrary to the results obtained by Gangasree and Karanjkar (2009) whose finding indicated that 57% of the farmers were non adopters of vaccination and 82% were non adopters of deworming practices.

Table 5: Division of adopters

Practices	Uttar Pradesh			Maharashtra		
	Adopters	Early	Late	Adopters	Early	Late
Vaccination for FMD	22(55)	14(35)	8(20)	33(82.5)	21(52.5)	12(30)
Vaccination for HS	16(40)	10(25)	6(15)	24(60)	16(40)	8(20)
Vaccination for BQ	8(20)	6(15)	2(5)	14(35)	9(22.5)	5(12.5)
Deworming	19(47.5)	12(30)	7(17.5)	32(80)	21(52.5)	11(27.5)
A.I.	24(60)	15(37.5)	9(22.5)	40(100)	26(65)	14(35)

Data in the parenthesis indicates %

Practices	Pooled data for the two districts		
	Adopters	early	late
Vaccination for FMD	55(68.75)	35(43.75)	20(25)
Vaccination for HS	40(50)	26(32.5)	14(17.5)
Vaccination for BQ	22(27.5)	15(18.75)	7(8.75)
Deworming	51(63.75)	33(41.25)	18(22.5)
A.I.	64(80)	41(51.25)	23(28.75)

Data in the parenthesis indicates %

Reasons for Adoption

Data in Table 6 depicts the reasons for adoption of various practices for vaccination, deworming and A.I. practices, awareness about the technology or its benefits ranked first in case of vaccination, deworming and A.I. Easy availability of the technologies was another reason for adoption.

Table 6: Reasons for adoption

Reasons	Uttar Pradesh			Maharashtra		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Awareness about the technology or its benefits, misconception about cost and benefits	2	2	2	2	2	2
Easy availability of Technologies	1	1.66	1	2	2	2
Easy application method	1	1.66	1	2	2	2
Availability of scientific training	0	0	0	0	0	0
Availability of adequate extension access	0.66	0.66	0.66	0.84	0.84	0.84
Availability of technical labour	0.93	0.93	0.93	2	2	2
Availability of incentive due to presence of proper marketing outlets	0	0	0	0.67	0.67	0.67
Availability of financial support	0	0	0	0	0	0

Reasons for adoption	Pooled data for the two districts		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Awareness about the technology or its benefits, misconception about cost and benefits	2(I)	2(I)	2(I)
Technologies are available, when needed	1.5(II)	1.83(II)	1.5(II)
Easy application method	1.5(III)	1.83(II)	1.5(III)
Availability of scientific training	0(VII)	0(VI)	0(VII)
Availability of adequate extension access	0.75(V)	0.75(V)	0.75(V)
Availability of technical labour	1.465(IV)	1.465(III)	1.465(IV)
Availability of incentive due to presence of proper marketing outlets	0.335(VI)	0.335(IV)	0.335(VI)
Availability of financial support	0(VII)	0(VI)	0(VII)

Data in the parenthesis indicates rank

Reasons for Non Adoption

In perusal of Table 7 it was found that lack of awareness about the technology or its benefits, misconception about its cost was the prime reason for non adoption of all the three technologies followed by lack of adequate extension access which ranked second. Lack of technical labour was ranked third for non adoption of vaccination, deworming and A.I. practices. Similar findings were also reported by Mishra and Bardhan (2009) in their study on the investigation into pattern of adoption of vaccination and deworming by dairy farmers in Tarai Area of Uttarakhand. Rogers (1995) cited that awareness knowledge is important for adoption of any technology as it act as motivator for persons to seek more knowledge.

Table 7: Reasons for Non adoption

Reasons for Non Adoption	Uttar Pradesh			Maharashtra		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Not aware about the technology or its benefits, misconception about cost	2	2	2	2	2	2
Technologies are not available or not available when needed	0.88	0.88	0.88	0	0	0
Cumbersome application method	0.25	0.25	0.66	0	0	0
Lack of scientific training	0	0	0	0	0	0
Lack of adequate extension access	1.45	1.45	1.45	1	1	1
Lack of technical labour	1.23	1.23	1.23	0	0	0
Lack of incentive due to absence of proper marketing outlets	0	0	0	0.67	0.67	0.67
Lack of financial support	0.66	0.66	1	0	0	1

Data in the parenthesis indicates rank

Reasons for Non adoption	Pooled data for the two districts		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Not aware about the technology or its benefits, misconception about cost and benefits	2(I)	2(I)	2(I)
Technologies are not available or not available when needed	0.44(IV)	0.44(IV)	0.44(IV)
Cumbersome application method	0.125(VII)	0.125(VII)	0.33(VI)
Lack of scientific training	0(VIII)	0(VIII)	0(VIII)
Lack of adequate extension access	1.225(II)	1.225(II)	1.225(II)
Lack of technical labour	0.615(III)	0.615(III)	0.615(III)
Lack of incentive due to absence of proper marketing outlets	0.335(V)	0.335(V)	0.335(V)
Lack of financial support	0.33(VI)	0.33(VI)	1(VII)

Reasons for Discontinued Adoption

Analysis of table 8 revealed that the prime reason for discontinued adoption of all the three technologies were its complexity (cumbersomeness). It may be due to the reason that both vaccination and A.I needs the help of specialist and cannot be done by farmers alone and for deworming the dosage and medicines are not easy to remember by the farmers and need to consult a veterinarian each time.

Table 8: Reasons for discontinued adoption

Reasons for Disadoption	Uttar Pradesh			Maharashtra		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Cumbersome application method	1.5	1.5	1.5	0.5	0.5	0
Technology is not profitable	2	2	2	2	1.5	0
Lack of sufficient training	0.5	0.5	0.5	1	1	0
Much time is required	0.5	0.5	1	0.5	0.5	0
Lack of credit	0	0	0	0	0	0

Reasons for Disadoption	Pooled data for the two districts		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Cumbersome application method	1(II)	1(II)	0.75(II)
Technology is not profitable	2(I)	1.75(I)	1(I)
Lack of sufficient training	0.75(III)	0.75(III)	0.25(IV)
Much time is required	0.5(IV)	0.5(IV)	0.5(III)
Lack of credit	0(V)	0(V)	0(V)

Data in the parenthesis indicates rank

Consequences of Adoption of Innovation

Data in table depicts the consequences for adoption of various practices. In case of vaccination reduced occurrences of diseases was ranked first. For deworming, improved health status of animal ranked first and for A.I. improved breeding characteristics of the animals ranked first.

Table 9: Consequences

Consequences	Uttarpradesh			Maharashtra		
	Vaccination(Mean score)	Deworming(Mean score)	A.I. (Mean score)	Vaccination(Mean score)	Deworming(Mean score)	A.I. (Mean score)
Reduced occurrence of respective disease	1.5	1.33	0	1.66	1.45	0
Improved health status of animal	1.3	1.3	1	1.78	1.56	1
Improved breeding characteristics of animals	0	0	1	0	0	1.45
Reduced cost of Disease management	0.66	0.45	0	0.78	0.78	0
Increased return from animal production	0.47	0.47	0.3	0.67	0.54	0.5
Improve livelihood status	0.47	0.47	0.3	0.67	0.54	0.5

Consequences	Pooled		
	Vaccination (Mean score)	Deworming (Mean score)	A.I. (Mean score)
Reduced occurrence of respective disease	1.58(I)	1.39(II)	0(IV)
Improved health status of animal	1.54(II)	1.43(I)	1(II)
Improved breeding characteristics of animals	0(V)	0(V)	1.225(I)
Reduced cost of Disease management	0.72(III)	0.615(III)	0(IV)
Increased return from animal production	0.57(IV)	0.505(IV)	0.4(III)
Improve livelihood status	0.57(IV)	0.505(IV)	0.4(III)

Data in the parenthesis indicates rank

Conclusion

It could be concluded from the present findings that improvement is needed in the dissemination of technology to the farmers of both the districts. Therefore, efforts should be made to educate the farmer and encourage them to adopt improved management practices. The farmers should be acquainted with these practices through organizing group meetings, training camps and deworming camps in the village to bridge the gap between existing and recommended practices. The reasons for discontinued adoption must be duly acknowledged and simple techniques should be used to clarify the concept and skills involved in each technology to farmers. Also ideal persuasion technique suited to each micro situation should be used in both the district to increase adoption of technologies.

References

1. Bhosale N. D. (1982) A study of factors related to the adoption of improved husbandry practices in regard to crossbred cattle in Solapur district. M.Sc. (Agri.) Thesis M.P.K.V., Rahuri. (M.S.).

2. Gangasagare,P.T and Karanjkar,L.M. (2009). Constraints in adopting animal husbandry practices by the dairy farmers in the marathwada region of Maharashtra, *Veterinary World*, Vol.2(9):347-349
3. Ghosh, R. K., A. Goswami and N. J. Maitra. 2008a. Adoption behavior of dairy farmers in cooperative farming systems. *Indian Res. J. Ext. Edu.* 8(1):31-35.
4. Kunzru, O. N. and Tripathi, H. (1994). A comparative study of adoption of dairy farm technologies between non-members and members of dairy co-operative villages. *Indian Journal of Animal Sciences*, 64(5): 501-507.
5. Mishra, P and Bardhan, D.(2009) An Investigation into Pattern of Adoption of Vaccination and Deworming by Dairy Farmers in Tarai Area of Uttarakhand. *J. Dairying, Foods & H.S.*, 28 (2) : 79-88
6. Rezaei, M. and Bagheri, A. (2011) Comparative analysis of characteristics of adopters and non-adopters of artificial insemination in Ardabil Province of Iran. *J. Food Agric.*, 23 (5): 466-472
7. Rogers, E.M. (1995) Diffusion of Innovation. 4th ed. Free Press, New York
8. Yadav,C.M., Bhimawat, B.S. and Khan, P.M.(2009) Existing breeding and healthcare practices of cattle in tribals of Dungarpur district of Rajasthan. *Indian Res. J. Ext. Edu.* 9 (1).