Factors Affecting Knowledge and Adoption of Preventive and Control Measures of Diseases among Goat Owners under Field Condition

Rakesh Roy[1] and Rupasi Tiwari[2]

ABSTRACT

Disease prevention is more economical than treatment and some diseases cannot be treated. Considering this factor the present study was taken up with the objective to assess knowledge and adoption level of preventive and control measures of diseases and factors affecting in knowledge and adoption among goat owners under field condition. The study was purposively conducted in West Bengal and Uttar Pradesh on the basis of high goat populated state in the country. In all, 180 respondents were randomly selected for the study. The study shows that majority of the respondents had knowledge of keeping feed and water trough clean and had adopted this practice. Disinfection of shed at least once in a week and isolation of healthy animals from sick animals was not known to majority of the respondents and therefore majority had not adopted this practice. Vaccination as preventive and control measure of diseases in goat was known to majority of the respondents even through the adoption of this practice was low. Proper disposal of carcass and litter was known to majority of the respondents thereby majority had fully adopted these practices. None had knowledge on quarantine of newly purchased animals, use of footbath and rotational grazing and thus adoption to these practices were nil. The study also shows that goat owners had medium level of knowledge but had low level of adoption. The study revealed that education, flock size, farming experience, mass media exposure, formal interpersonal contact and social participation had significant and positive association with knowledge level similarly education, family education status, knowledge level, mass media exposure, formal interpersonal contact and social participation had significant and positive association with adoption. The study further revealed that education and farming experience of the respondents were main contributing factors for knowledge level in preventive and control measures of diseases and knowledge level, mass media exposure, income in goat farming and annual family income were the main contributing factors in adoption of preventive and control measures of diseases.

Keywords*: Adoption, goat owners, knowledge, preventive and control measures

INTRODUCTION

The livestock production sector, besides the substantial improvements in the poultry and dairy production systems, the development of the other livestock technologies was neglected. Nevertheless, the usage of veterinary services and medicine technologies remains important for any livestock farmer, as disease and high mortality are major constraints on livestock production and food security. This leads to the major problem that farmers produce below capacity.

The literature on diffusion and adoption of livestock technologies suggests that the adoption behaviour of farmers is explained by socio-economic characteristics of the farmer and communication sources used (Chandra *et al.,* 2005), perceptions about livestock technology (Oladele and Rantseo, 2010) and institutions and

[1]Subject Matter Specialist (Animal Sc.), Darjeeling KVK, Uttar Banga Krishi Viswavidylaya, Kalimpong-734301, WB, [2]Principal Scientist and In-charge ATIC, ICAR-Indian Veterinary Research Institute, Izatnagar- 243122, Bareilly, UP.

infrastructure available (Hayami andRuttan, 1985). It has been further observed that the main limitations to effective livestock health management are an inadequate focus on preventive measures, lack of medicines and equipment in rural veterinary clinics and ignorance among the farmers. This was reflected in the frequent occurrence of many of these diseases in most parts of the country (Dey *et al.*, 2007). Identifying the variables that determine the adoption of medication technologies and differentiate between farmers who adopt at various levels (fully, partly or non) and those who do not, can have promising, cost-saving and economic impacts on the planning and execution of future extension programs. The adoption of prophylactic and preventive measures in goats could result in a net savings of ₹ 5144 million per annum to the economy of the country (Anonymous, 2017). Disease prevention is more economical than treatment and some diseases cannot be treated. In these cases the use of external and internal parasite remedies as well as vaccines as a prophylactic treatment are the most effective means of disease control (Hunter, 1993).

The reasons for poor adoption of veterinary technologies among livestock farmers all over the world are not fully understood. There is a generally accepted perception among veterinary practitioners that these farmers "react on what they see" when it comes to the adoption of these technologies and prefer a therapeutic approach rather than a preventative one (Erasmus, 1998 and McDonald, 1998). Therefore, a study had been taken up to with an objective to assess knowledge and adoption of goat owners in India on preventive and control measures of diseases.

METHODOLOGY

The study was purposively selected in West Bengal (WB) and Uttar Pradesh (UP) on the basis of high goat populated state in the country. North 24 Parganas district from WB and Mathura district from UP were randomly selected for the study. Again, two blocks were randomly selected from the district and 45 farmers were randomly selected from each block for data collection, thus 90 farmers were selected from each state and 180 respondents form the total sample size for the study. Data

were collected through semi structured interview schedule. Adoption index was measured in 3 point continuum i.e., full adopter =3, partial adopter =2 and non adopter =1. Adoption index was calculated from mean score obtained divided by maximum obtainable score multiplied by 100. (i.e., Adoption index = Mean score obtained / Maximum obtainable score X 100). For interpretation of data; analysis such percentage, mean, standard deviation, t-test, correlation and regression were done using SPSS 18 package.

RESULTS AND DISCUSSION

Knowledge and extent of adoption

Keeping feed and water trough clean as a preventive and control measures of diseases was known to majority (85.56%) of the respondents and similarly majority of the respondents had adopted this practice where 45 percent of the respondents had fully adopted and 43.89 percent of the respondents had partially adopted this practice. Only 14.44 percent of the respondents had not adopted this practice. However, full adopter in this practice was found higher in UP than WB but partial adopter was higher in WB than UP (Table 1 & 2).

The knowledge of disinfection of shed at least once in a week as a preventive and control measures of diseases was found among 37.78 percent of the respondents. Thus, majority (62.22%) of the respondents had not adopted disinfection of shed at least once in a week. Only 8.33 percent and 29.44 percent of the respondents had fully and partially adopted this practice respectively. Both full and partial adopter was found higher in UP than WB (Table 1&2). Kulkarni and Jawahar (2000) also reported that 82.50 percent of small goat holder did not adopt sanitary practices in their goat shed.

The knowledge of isolation of sick animals from healthy animals as a preventive and control measures of diseases was found among 39.44 percent of the respondents. This practice had been adopted fully (15.56%) and partially (22.78%) by the respondents. Majority (61.67%) of the respondents had not adopted isolation of sick animals as a preventive and control measures of diseases. Both full and partial adopter in

this practice was found higher in WB than UP. Non adoption to this practice might be due to lack of knowledge and lack of separate housing facilities for sick animals (Table 1&2). Similar finding were reported by Deshpande *et al.* (2009) where they reported that only 4.51% goat keepers follow the isolation of sick animals away from healthy stock.

Vaccination as a preventive and control measures of diseases was known to majority (70%) of the respondents though majority the farmers could not mention the disease against which vaccination needs to be given. But, vaccination against important diseases was adopted fully (6.67%) and partially (11.67%) by the respondents. Majority (81.67%) of the respondents had not adopted vaccination as a preventive and control measures of

diseases. It has to be mentioned that almost all the respondents who had adopted vaccination were from WB. Only 2.22 per cent of the respondents from UP had partially adopted vaccination of healthy animals (Table 1&2). Low adoption of vaccination might be due to lack of knowledge about preventive health technology and inadequate veterinary service. Kumar *et al.* (2014) also reported nearly similar finding in his study while Deshpande *et al.* (2009) contradicts the study where he reported that vaccination of goat against different diseases prior to monsoon was done by 69.19 per cent of the respondents. Apart from that, certain misconception like vaccination make animal infertile, led to fever, reduces feed intake were associated with vaccination. Failure of government to supply vaccine free of cost at the door step of the farmers might be another reason for non adoption of

Table 1: Distribution of the respondents according to knowledge on control measures of diseases

Practices	WB (n=90)	UP (n=90)	Total (N=180)
Keep feed and water trough clean	80 (88.89)	74 (82.22)	154 (85.56)
Disinfection of shed	30 (33.33)	38 (42.22)	68 (37.78)
Isolation of sick animals	55 (61.11)	16 (17.78)	71 (39.44)
Vaccination	90 (100.00)	36 (40.00)	126 (70.00)
Rotational grazing	0 (0.00)	0 (0.00)	0 (0.00)
Parasitic control	35 (38.89)	21 (23.33)	56 (31.11)
Use of foot bath	0 (0.00)	0 (0.00)	0 (0.00)
Quarantine for newly purchase animals	0 (0.00)	0 (0.00)	0 (0.00)
Proper disposal of carcass	60 (66.67)	77 (85.56)	137 (76.11)
Proper disposal of litter material	61 (67.78)	60 (66.67)	121 (67.22)

Figures in parenthesis indicate percentage

Table 2: Distribution of the respondents on the basis of extent of adoption in control measures of diseases

Practices	WB (n= 90)			UP (n= 90)			Total (N=180)		
	FA	PA	NA	FA	PA	NA	FA	PA	NA
Keep feed and water trough clean	39(43.33)	41(45.56)	10(11.11)	42(46.67)	38(42.22)	16(17.78)	81(45.00)	79(43.89)	26(14.44)
Disinfection of shed	6(6.67)	24(26.67)	60(66.67)	9(10.00)	29(32.22)	52(28.89)	15(8.33)	53(29.44)	112(62.22)
Isolation of sick animals	25(27.78)	35(38.89)	30(33.33)	3(3.33)	6(6.67)	81(90.00)	28(15.56)	41(22.78)	111(61.67)
Vaccination	12(13.33)	19(21.11)	59(65.56)	00(0.00)	2(2.22)	88 (97.78)	12(6.67)	21(11.67)	147 (81.67)
Rotational grazing	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	180(100)
Parasitic control	12(13.33)	20(22.22)	58(64.44)	6(6.67)	12(13.33)	72(80.00)	18(10.00)	32(17.78)	130(72.22)
Use of foot bath	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	180(100)
Quarantine for newly purchase animals	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	90(100)	00(0.00)	00(0.00)	180(100)
Proper disposal of carcass	49(54.44)	12 (13.33)	29(32.22)	60(66.67)	15(16.67)	15(16.67)	109 (60.56)	27 (15.00)	44 (42.44)
Proper disposal of litter material	49(54.44)	11 (12.22)	30 (33.33)	57 (63.33)	3(3.33)	30(33.33)	106 (58.89)	14(7.78)	60(33.33)

FA= Full adopter, PA= Partial adopter, NA= Non adopter; Figures in parenthesis indicate percentageLevel of knowledge and adoption

vaccination technology in spite of knowledge about vaccination in WB.

Proper disposal of carcass as a preventive and control measures of diseases was known to majority (76.11%) of the respondents and similarly majority (60.56%) of the respondents had fully adopted this practice. This practice had also been partially (15%) and not (24.44%) adopted by the respondents. Both full and partial adopter was found higher in UP than WB in this practice (Table 1&2).

Proper disposal of litter as a preventive and control measures of diseases was known to majority (67.22%) of the respondents and similarly this practice had been fully adopted by majority (58.89%) of the respondents. Further, this practice had also been partially (7.78%) and not (33.33%) adopted by the respondents (Table 1&2).

Table 3: Knowledge level of goat owners in preventive and control measures of diseases

Knowledge level	WB (n= 90)	UP (n= 90)	Total (n= 180)
Low (0-3)	29 (32.22)	49 (54.44)	78 (43.33)
Medium (4-6)	49 (54.44)	38 (42.22)	87 (48.33)
High (7-10)	12 (13.33)	3 (3.33)	15(8.33)
Mean ± SD	4.56 ±1.66	3.53±1.66	4.07± 1.73
t-test value	3.982**		

Figures in parenthesis indicate percentage; **p<0.01

The knowledge of parasitic control as a preventive and control measures of diseases was found among 31.11 percent of the respondents. Thus, majority (72.22%) of the respondents had not adopted this practice. Only 10 percent and 17.78 percent of the respondents had fully and partially adopted parasitic control as a preventive and control measures of diseases (Table 1 & 2).

Practices like quarantine of newly purchase animal, use of foot bath and rotational grazing or management of pasture were known to none. Naturally, none of the respondents had adopted quarantine for newly purchased animal, use of footbath at the entry to the goat farm and rotational grazing or management of pasture as preventive and control measures of diseases (Table 1 & 2). Rashmi (2010) also reported that none of the goat farmers had adopted quarantine practices in Uttar Pradesh.

The mean knowledge score of the respondents in preventive and control measures of diseases was medium (4.07) level on a ten point score whereas the mean knowledge level in preventive and control measures of diseases was more in WB (4.56) than UP (3.53). The result also shows that majority of the overall respondents had medium (48.33%) followed by low (43.33%) and high (8.33%) level of knowledge in preventive and control measures of diseases. Similarly, majority of the respondents had medium (54.44%) followed by low (32.22%) and high (13.33%) level of knowledge in preventive and control measures of diseases in WB whereas majority of the respondents had low (54.44%) followed by medium (42.22%) and high (3.33%) level of knowledge in preventive and control measures of diseases in UP (Table 3). Control measures largely depend on the knowledge base of small ruminant producers for their success (Marchal *et al.,* 2017). The t- test analysis also revealed highly significant difference between two states with respect to knowledge in preventive and control measures of diseases. This might be due to difference in education level of the respondents, family education status, formal interpersonal agency contact etc.

The mean adoption index from ten improved practices in preventive and control measures of diseases was 27.61

Table 4: Adoption level of goat owners in preventive and control measures of diseases

Adoption Level	WB (n= 90)	UP (n= 90)	Total (n = 180)
Non adopter (<33.33)	46(51.11)	31(34.44)	77(42.78)
Partial adopter (33.34-66.66)	39(43.33)	58(64.44)	97(53.88)
Full adopter (>66.67)	5(5.56)	1(1.11)	6(3.33)
Mean ± SD	30.06±17.07	25.17±12.05	27.61± 14.93
t-test value	2.220*		

Figures in parenthesis indicate percentage; *p<0.05

which means that goat owners were non adopter in preventive and control measures of diseases under field condition. Similarly, it was in WB (30.06) and UP (25.17). The result also shows that majority of the overall respondents were partial adopter (53.88%) followed by non adopter (42.78%) and full adopter (3.33%) in preventive and control measures of diseases. However, majority of the respondents were non adopter (51.11%) in preventive and control measures of diseases followed by partial (43.33%) and full adopter (5.56%) in WB whereas majority of the respondents were partial adopter (64.44%) followed by non adopter (34.44%) and full adopter (1.11%) in preventive and control measures of diseases (Table 4). It might be due to the fact that farmers prefer a therapeutic approach rather than a preventative one. The t- test analysis revealed significant difference between two states with respect to level of adoption in preventive and control measures of diseases.

Relationship of different factors with knowledge and adoption in preventive and control measures of diseases

The study revealed that out of thirteen selected independent variables education (p<0.01), flock size (p<0.01), farming experience (p<0.05), mass media exposure (p<0.01), formal interpersonal contact (p<0.01) and social participation (p<0.01) had significant and positive association with knowledge level in preventive and control measures of diseases. Family size (p<0.01)

also had significant but negative association with knowledge level in preventive and control measures of diseases (Table 5).

The study further revealed that out of fourteen selected independent variables, education (p<0.01), family education status (p<0.05), knowledge level (p<0.01), mass media exposure (p<0.01), formal interpersonal contact (p<0.01) and social participation (p<0.01) had significant and positive association with adoption index for preventive and control measures of diseases while family size (p<0.05) had significant but negative association with adoption index for preventive and control measures of diseases (Table 6). Chandra *et al.* (2005) also reported that education of the respondent, family education status, communication sourcespositively correlated with adoption of improved goat farming practices among tribal and non-tribal goat farmers.

Factors contributing to knowledge and adoption of preventive and control measures of diseases

The study depicts that education of the respondents and farming experience were the main contributing factors to farmers' knowledge level in preventive and control measures of diseases. It may be concluded that higher education and higher farming experience were having higher knowledge level in preventive and control measures of diseases regarding goat farming. Here R^2 value is 0.683, meaning 68.3 per cent of the variance in

Table 5: Correlation coefficient of farmers' knowledge level with selected independent variables

Independent Variables	WB	UP	Total
Age	-0.045	-0.196	-0.121
Family size	-0.063	-0.112	-0.196**
Education	0.539**	0.699**	0.630**
Family education status	0.094	0.174	0.247
Land holding	0.329**	0.153	0.093
Flock size	0.634**	0.462*	0.544**
Farming experience	0.402**	0.340	0.358*
Income in goat farming	0.553**	0.261*	0.318
Annual family income	0.149	0.051	0.019
Mass media	0.412**	0.470**	0.449**
Formal interpersonal	0.482**	0.604**	0.578**
Informal interpersonal	0.004	0.117	0.010
Social participation	0.386**	0.403**	0.411**

*p<0.05, **p<0.01

Table 6: Correlation coefficient of farmers' adoption level with selected independent variables

Independent Variables	WB	UP	Total
Age	-0.060	-0.124	-0.088
Family size	-0.072	-0.136	-0.152*
Education	0.525**	0.685**	0.595**
Family education status	0.073	0.166	0.173*
and holding	0.349**	0.112	0.111
Flock size	0.649**	0.264*	0.334
Farming experience	0.379**	0.132	0.223
Income in goat farming	0.630**	0.267*	0.410
Annual family income	0.161	0.101	0.080
Knowledge level	0.941**	0.893**	0.905**
Mass media	0.494**	0.543**	0.518**
Formal interpersonal	0.532**	0.636**	0.582**
Informal interpersonal	-0.005	0.105	0.014
Social participation	0.426**	0.484**	0.459**

*$p<0.05$, **$p<0.01$

knowledge level in preventive and control measures of diseases is explained by education and experience in goat farming.

The study further reveals that knowledge level, mass media exposure, income in goat farming and annual family income were the main contributing factors to farmers' adoption index for preventive and control measures of diseases. It may be concluded that farmers having higher knowledge level, higher mass media exposure, higher income in goat farming and higher annual family income were having higher adoption level in preventive and control measures of diseases regarding goat farming. Wadkar *et al.* (2009) also reported in his study that social participation, sources of information, formal interpersonal contact was crucial in adoption of goat rearing practices. Here R^2 value is 0.852, meaning 85.2 percent of the variance in adoption index for control measures of diseases is explained by knowledge level on control measures of diseases, mass media exposure, income in goat farming and family income.

CONCLUSION

The study showed that the goat owners were poor knowledge level or ignorant to some of the important practices in preventive and control measures of diseases. Further, it has been seen that even though the farmers had knowledge about some practices but they had not fully adopted these practices. These might be due to lack of knowledge about these improved practices or might be due to the fact that farmers prefer a therapeutic approach rather than a preventive one or lack of animal healthcare services at their doorstep. In this situation, there is a need to enhance knowledge about the prophylactic measures and its importance through different extension methods or tools so that the goat owners can adopt these improved prophylactic measures and prevent morbidity and mortality of their farm animals and thereby reduce economic losses. Extension agencies working in these regions should establish a mechanism for generating a formal and planned methods and media consisting field visits, demonstrations, training courses, seminars and workshops, exhibitions, educational bulletins, education film, television and radio programs for enhancing communication linkages between formal extension agencies and livestock owners so that information on improved livestock farming can be disseminated in large scale. Providing ICT tools such as computer, self learning ICT tools in local language in village level and access to internets in those villages with other suitable communication tools can speed up the transfer of important information to livestock owners.

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