

*Original Research***Awareness and Perception About Risk of Zoonoses Among Livestock Farmers in Sub-Himalayan Region of West Bengal****Rakesh Roy<sup>1\*</sup>, Tista Mondal<sup>2</sup> and Mendel Wangchuk Moktan<sup>3</sup>**<sup>1</sup>Malda Krishi Vigyan Kendra, UBKV, Ratua, Malda-732205, West Bengal, INDIA<sup>2</sup>Poultry Multiplication Centre, GTA, Seed Farm, Kalimpong-734301, West Bengal, INDIA<sup>3</sup>Darjeeling Krishi Vigyan Kendra, Uttar Banga Krishi Viswavidyalaya, Kalimpong- 734301, West Bengal, INDIA**\*Corresponding author:** [rakeshvetext@gmail.com](mailto:rakeshvetext@gmail.com)

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**Abstract**

The study was undertaken with an objective to assess awareness and perception about risk of zoonoses among livestock farmers in Sub-Himalayan region of West Bengal. In all, 120 randomly selected livestock farmers were the sample size for the study. The study shows that rabies as a zoonotic disease was known to cent percent of respondents followed by bird flu, Japanese encephalitis and swine flu. The study further shows that oral or ingestion as a mode of transfer of diseases was known to 51.67 percent of respondents followed by direct contact and through vector as a mode of transfer of zoonotic diseases. The respondents had perception that pork, chicken meat and beef can spread zoonoses. The livestock farmers strongly perceived that disposing of dead animals and eating uncooked meat had a high risk of zoonoses. Studying awareness and perception of the livestock farmers on the risk factors and routes of transmission of zoonotic diseases is an essential step towards planning and development of appropriate disease prevention and control strategies for both human being and livestock which may reduce huge economic consequences in both the sectors.

**Key words:** Awareness, Perception, Risk, Sub-Himalayan Region, Zoonoses**How to cite:** Roy, R., Mondal, T., & Moktan, M. (2019). Awareness and Perception about Risk of Zoonoses among Livestock Farmers in Sub-Himalayan Region of West Bengal. International Journal of Livestock Research, 9(9), 180-187. doi: 10.5455/ijlr.20180726062550**Introduction**

Zoonoses (also known as zoonosis and as zoonotic disease) are infectious disease caused by bacteria, viruses and parasites that spread between animals (usually vertebrates) and humans (Mariam and Mariam, 1982). A zoonosis is any infectious disease that can be transmitted from animals, both wild and domestic, to humans (Coleman, 2002; WHO/FAO/OIE, 2004). Zoonoses are the infectious diseases that can be naturally transmitted from animals to human and of all the known human pathogens 60% are zoonotic in

nature. About 75% newly recognized pathogens fall within the category of zoonotic diseases. Zoonotic diseases cause mortality and morbidity in people, while also imposing significant economic losses in the livestock sector. Their burden tends to fall most heavily on poor societies (WHO, 2005).

Different management practices and environmental circumstances in traditional and smallholder livestock keeping systems in rural and urban areas can influence the risk of zoonoses (Omu and Amuta, 2007). Moreover, certain occupations have a higher risk of contracting zoonoses (Swai and Schoonman, 2009). Rabies, tuberculosis, avian influenza and brucellosis were the common zoonotic diseases associated with works while diseases or infections and death were the common possible implications of zoonoses perceived by the workers (Tripathi *et al.*, 2017). This is clearly the case where the disease is transmitted through direct contact with infected animals or infected animal materials. Practices, which could reduce or increase the risk of zoonoses, in the various livestock keeping systems and to the public as whole, will depend on awareness, perceptions, knowledge and attitude to zoonoses (John *et al.*, 2008). Considering this, the study was undertaken with an objective to assess awareness and perception of the livestock farmers about risk of zoonoses in the Sub-Himalayan region of West Bengal.

## Materials and Methods

### Study Area

This study was conducted in Sub-Himalayan region of West Bengal during Nov, 2016 to April 2017.

### Sampling Method

The respondents were randomly selected from two hill districts (i.e., Darjeeling and Kalimpong) in Sub-Himalayan region of West Bengal. Two blocks each from two districts and 30 farmers per block was randomly selected for the study. Thus, 120 respondents were the total sample size for the study.

### Data Collection and Analysis

The data were collected with the help of semi-structured interview schedule by personal interview method. The respondents were briefed about the study. The perception about risk of zoonoses was measured on 5-point rating scale where 1 was minimum and 5 was maximum. Mean value more than 3 reveal that respondents had perception that it can spread zoonoses whereas less than 3 reveal that respondents perceived that it cannot spread zoonoses. Simple statistical tools such as frequency and percentage were used for assessment of awareness and mean was used for assessment of perception about risk of zoonotic diseases.

## Results and Discussion

### Awareness about Major Zoonotic Diseases

Rabies as a zoonotic disease was known to cent percent of the respondents. Bird flu and swine flu as a zoonotic disease was known to 70.83 percent and 63.33 percent of the respondents respectively. Japanese encephalitis zoonotic disease was known to 65.83 percent of the respondents (Table 1). Zoonotic diseases such as anthrax, taeniasis, echinococcosis, bovine tuberculosis, brucellosis and ring worm infection as zoonotic disease was known to about 1.67 to 13.33 percent of the respondents only. Other diseases of zoonotic importance excluding these were unknown to the respondents. Rabies as zoonotic disease was known to all the respondents might be due to high dog population in the study area and dog bite had a high risk of spreading rabies. Awareness of the respondents about other disease like bird flu, Japanese encephalitis and swine flu might be due to occurrence of Japanese encephalitis in recent past nearby the study area and high media coverage by the government and news channels on bird flu and swine flu in recent past. Babu *et al.* (2015) reported that anthrax, brucellosis, leptospirosis, and salmonellosis are prevalent in different areas of Andhra Pradesh, but all the respondents revealed that rabies was known to them and most of the respondents were unaware about other zoonotic diseases. Rabies was the only disease of zoonotic importance which was known to highest number of respondents (Swai *et al.*, 2010 and Hundal *et al.*, 2016).

**Table 1:** Awareness about major diseases of zoonotic importance

S. No.	Zoonotic Diseases	Livestock Farmers	
		Frequency	%
1.	Rabies	120	100
2.	Japanese encephalitis	79	65.83
3.	Bird flu	85	70.83
4.	Swine flu	76	63.33
5.	Anthrax	4	3.33
6.	Taeniasis	11	9.17
7.	Echinococcosis	16	13.33
8.	Bovine tuberculosis	2	1.67
9.	Brucellosis	3	2.5
10.	Ring worm	10	8.33

#### Awareness About Mode of Transfer of Zoonotic Diseases

The study shows that oral or ingestion as a mode of transfer of diseases was known to 51.67 percent of respondents. Direct contact as a mode of transfer of diseases was known to 40 percent of respondents. Transmission of diseases through vector was known to 28.33 percent of respondents. Aerosol or inhalation as a mode of transfer of diseases was known to 21.67 percent of respondents. Transmission of diseases through fomites or object that can carry a pathogen from an animal to a person was known to 3.33 percent of the respondents only (Table 2). Prabhakar *et al.* (2016) found that majority of respondents (72.09%) were unaware about the modes of spread and transmission of zoonotic diseases. Babu *et al.* (2015) reported that

only 16.24% of the farmers and agricultural workers were aware about the diseases that were transmitted between animals and human beings. Sahay *et al.* (2010) reported that majority of the butchers and cent percent of meat retailers had considered contact with infected person as the important mode of disease transmission.

**Table 2:** Awareness about mode of transfer of zoonotic diseases

S. No.	Mode of Transfer of Disease	Livestock Farmers	
		Frequency	%
1.	Aerosol or inhalation	26	21.67
2.	Oral or ingestion	82	68.33
3.	Direct contact	68	56.67
4.	Vector	34	28.33
5.	Fomite or object	4	3.33

### Perception About Risk of Spreading Zoonoses From Various Animal Products

The result shows that respondents had perceived that pork had highest (3.85) risk of spreading zoonoses followed by chicken meat (3.82) and beef (3.32) out of 5-point rating scale (Table 3). Regarding other animal products the respondents had perception that these products do not have any risk of spreading zoonoses. Further 36.67 percent of the respondents strongly agreed that pork and chicken meat can spread zoonoses whereas 25 percent of the respondents agreed that pork and chicken meat can spread zoonoses. There is risk of spreading zoonoses through beef was also strongly agreed (22.5%) and agreed (27.5%) by the respondents. Swai *et al.* (2010) reported that 95% of respondents (both livestock keepers and animal health workers) indicated that consumption of animal products, milk or meat or blood as the primary route for transmission of diseases to humans which have a risk of spreading zoonoses. Among all interviewed house-holds, 71% were considered themselves at risk of rabies (Newayeselassie *et al.*, 2012).

**Table 3:** Perception about risk of spreading zoonoses from various animal products

S. No.	Animal Products	Rating Scale (%)					Mean
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
1.	Cow milk	68(56.67)	24(20.00)	12(10.00)	10(8.33)	6(5.00)	1.85
2.	Goat milk	76(63.33)	19(15.83)	10(8.33)	9(7.50)	6(5.00)	1.75
3.	Chevon	45(37.50)	21(17.50)	19(15.83)	23(19.17)	12(10.00)	2.47
4.	Mutton	45(37.50)	21(17.50)	19(15.83)	23(19.17)	12(10.00)	2.47
5.	Beef	18(15.00)	13(10.83)	29(24.17)	33(27.50)	27(22.50)	3.32
6.	Pork	3(2.50)	10(8.33)	33(27.50)	30(25.00)	44(36.67)	3.85
7.	Chicken meat	5(4.17)	10(8.33)	31(25.83)	30(25.00)	44(36.67)	3.82
8.	Chicken egg	31(25.83)	22(18.33)	25(20.83)	28(23.33)	14(11.67)	2.77
9.	Duck egg	31(25.83)	22(18.33)	25(20.83)	28(23.33)	14(11.67)	2.77

Figures in parentheses indicate percentage

### Perception About Risk of Zoonoses from Farm Activities and Food Habits

The respondents strongly perceived that activities like disposing of dead animals had a risk of zoonoses (4.07) out of 5-point rating scale. The respondents further perceived that other activities such as dealing with sick animal (3.42), disposing of infective material (3.35) and treating of minor ailments (3.15) had a risk of zoonoses (Table 4).

**Table 4:** Perception about risk of zoonoses from farm activities and food habits

S. No.	Activities	Rating Scale (%)					Mean
		Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree	
<b>Attending of Livestock</b>							
1.	Assisting during birth in animals	21(17.50)	27(22.50)	32(26.67)	27(22.50)	13(10.83)	2.87
2.	Contact with placenta	18(15.00)	27(22.50)	33(27.50)	27(22.50)	15(12.50)	2.95
3.	Dealing with sick animals	9(7.50)	20(16.67)	29(24.17)	36(30.00)	26(21.67)	3.42
4.	Treating of minor ailments	20(16.67)	22(18.33)	25(20.83)	26(21.67)	27(22.50)	3.15
5.	Disposing of infective material	0(0)	37(30.83)	30(25.00)	27(22.50)	26(21.67)	3.35
6.	Disposing of dead animals	0(0)	4(3.33)	31(25.83)	38(31.67)	47(39.17)	4.07
<b>Farm Related Activities</b>							
1.	Cleaning of animal shed	9(7.50)	16(13.33)	31(25.83)	37(30.83)	27(22.50)	3.48
2.	Milking of animals	38(31.67)	29(24.17)	20(16.67)	31(25.83)	2(1.67)	2.42
3.	Sharing house with animals	43(35.83)	22(18.33)	31(25.83)	18(15.00)	6(5.00)	2.35
4.	Slaughtering of livestock	0(0)	14(11.67)	44(36.67)	30(25.00)	32(26.67)	3.67
5.	Preparing skin	0(0)	5(4.17)	30(25.00)	55(45.83)	30(25.00)	3.92
6.	Collecting of fodder	33(27.50)	24(20.00)	31(25.83)	16(13.33)	16(13.33)	2.65
7.	Disposing of waste	0(0)	15(12.50)	30(25.00)	36(30.00)	39(32.50)	3.83
<b>Food Habits</b>							
1.	Drinking raw milk	7(5.83)	38(31.67)	26(21.67)	28(23.33)	21(17.50)	3.15
2.	Drinking pasteurized milk	48(40.00)	42(35.00)	27(22.50)	3(2.50)	0(0)	1.88
3.	Eating uncooked meat	0(0)	0(0)	17(14.17)	54(45.00)	49(40.83)	4.27
4.	Eating well cooked meat	0(0)	73(60.83)	25(20.83)	22(18.33)	0(0)	2.58
5.	Eating raw egg	10(8.33)	35(29.17)	53(44.17)	17(14.17)	5(4.17)	2.77
6.	Drinking water close to shed	18(15.00)	27(22.50)	33(27.50)	27(22.50)	15(12.50)	3.07

Figures in parentheses indicate percentage

Further, 39.17 percent and 31.67 percent of the respondents strongly agreed and agreed respectively that disposing of dead animals had a risk of zoonoses. There is risk of zoonoses by dealing with sick animal was strongly agreed (21.67%) and agreed (30%) by the respondents. Risk of zoonoses by disposing of infective material was strongly agreed (21.67%) and agreed (22.5%) by the respondents. Risk of zoonoses by treating of minor ailments was strongly agreed (22.5%) and agreed (21.67%) by the respondents. The respondents perceived that farm related activities such as preparing of skin (3.92), disposing of waste (3.83),

slaughtering of livestock (3.67) and cleaning of animal shed (3.48) had a risk of zoonoses in doing these farms related activities. Further, 25 percent and 45.83 percent of respondents strongly agreed and agreed respectively that preparing of skin had a risk of zoonoses. There is risk of zoonoses by disposing of waste was strongly agreed (32.5%) and agreed (30%) by the respondents. Risk of zoonoses by slaughtering of livestock was strongly agreed (26.67%) and agreed (25%) by the respondents. Risk of zoonoses by cleaning of animal shed was strongly agreed (22.5%) and agreed (30.83%) by the respondents. Swai *et al.* (2010) reported that majority of respondents (both livestock keepers and animal health workers) indicated that sharing their house with animals as the primary route for transmission of diseases to humans which has a risk of spreading zoonoses.

Regarding food habit, the respondents strongly perceived that eating uncooked meat (4.27) had a risk of zoonoses. The respondents had perceived that drinking of raw milk (3.15) and drinking water from the sources close to animal sheds (3.07) had a risk of zoonoses. Further, 40.83 percent and 45 percent of respondents strongly agreed and agreed respectively that eating uncooked meat had a risk of zoonoses. There is risk of zoonoses by drinking raw milk was strongly agreed (17.50%) and agreed (23.33%) by the respondents. Risk of zoonoses by drinking water from the sources close to animal sheds was strongly agreed (12.5%) and agreed (22.5%) by the respondents.

### Relationship of Socio-Economic Character with Perception Level About Risk of Zoonoses

Table 5 revealed that socio-economic variables such as education, family education status and annual income had highly significant and positive association with perception level about risk of zoonoses. The other socio-economic variables were non-significant with perception level about risk of zoonoses.

**Table 5:** Correlation of farmers' perception level about risk of zoonoses with socio-economic variables

S. No.	Variables	Correlation
1.	Age	-0.126
2.	Gender	0.082
3.	Education	0.647**
4.	Family education status	0.611**
5.	Occupation	-0.17
6.	Annual income	0.457**
7.	Social participation	0.111

\*\* $p < 0.01$

### Contributing Factors to Perception Level About Risk of Zoonoses

Table 6 shows multiple regression of perception level about risk of zoonoses with socio-economic character. The result depicts that education and family education status were the main contributing factors to farmers' perception level about risk of zoonoses. The result also depicts that age was one of the main contributing factors to farmers' perception level about risk of zoonoses. It may be concluded that higher

was the education and family education status higher was the perception level about risk of zoonoses whereas lower in age of the respondents higher was the perception level about risk of zoonoses. Here  $R^2$  value is 0.730, meaning 73 percent of the variance of perception level about risk of zoonoses is explained by the independent variables.

**Table 6.** Multiple regression of perception about risk of zoonoses with socio-economic characteristics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	17.548	11.192		1.568	0.127
Age	-0.529	0.217	-0.322	-2.440**	0.02
Gender	3.104	5.454	0.057	0.569	0.573
Education	1.026	0.22	0.478	4.671**	0
Family Education Status	0.902	0.19	0.535	4.746**	0
Occupation	4.927	2.447	0.212	2.013	0.053
Annual Income	-0.104	1.81	-0.007	-0.058	0.954
Social Participation	3.378	2.275	0.156	1.485	0.147

$R^2 = 0.730$ , \*\* $p < 0.01$

### Conclusion

Studying the awareness and perception of the livestock farmers about the risk factors and routes of transmission of zoonotic diseases is an essential step towards planning and implementation of appropriate disease prevention and control strategies. The study had clearly pointed out that awareness of the livestock farmers about diseases of zoonotic importance were not clear in the study area. Among the different zoonotic diseases that exist in the nature only rabies was known to all the respondents of the study area. Few other zoonotic diseases were also known to the respondents due to its occurrence and media coverage of the diseases. The absence of awareness about other zoonotic diseases in the study area might be due to poor or lack of awareness program by medical and veterinary health care professionals as well as poor media coverage. Therefore, awareness has to be created about zoonotic diseases and their modes of transmission by both medical and veterinary extension professionals to reduce risk of spreading these zoonotic diseases which may reduce huge economic consequences in both the sectors.

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