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Knowledge assessment through surveying on cattle zoonotic diseases in Bidar district (Karnataka) dairy farmers

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Abstract

This cross sectional study was conducted in 100 dairy farmers from Bidar district, Karnataka state with a designed questionnaire on different aspects of cattle zoonotic diseases, with the aim to study the awareness, risk factors of cattle zoonotic diseases, impact on human and animal populations. The study revealed that, 85 per cent farmers belongs to 26-50 years age and 73 per cent of them were male. Only 25 per cent farmers did schooling. These farmers had an annual income in the range of Rs.50, 000-1,00,000 through agricultural cum dairy farming. 53 per cent farmers had less than 5 dairy cows in their farm, 57 per cent dairy farmers having less than 5 years of experience in dairy farming and 59 per cent respondents followed semi intensive method of cattle rearing. 74 per cent and 77 per cent dairy farmers were aware about deworming and zoonotic diseases, respectively. 56 per cent respondents were aware of route of transmission of zoonotic diseases and also knew ingestion (55 per cent) was the major route of transmission. It was observed that out of 100 farmers interviewed, only 22 per cent had any immunosuppressive disease. Also our study revealed that 11 percent respondents had a habit of smoking in dairy farm. 29 per cent farmers screened their dairy cattle for zoonotic diseases and also 49 per cent farmers have never done any type of screening to rule out the zoonotic diseases. 33, 30 and 19 per cent received the sources of information on awareness about the zoonotic diseases from media, veterinarian and physician. It was concluded that dairy farmers were well aware of rabies and foot and mouth disease but the knowledge towards other zoonotic diseases was low to medium. This study can be used for development of a coordinated, effective one health approach to prevention of zoonotic disease.

Keywords: Knowledge assessment-cattle zoonotic diseases dairy farmers

Introduction

Zoonoses is defined by the World Health Organization as 'diseases and infections which are transmitted naturally between vertebrate animals and man' (WHO, 1959).

They are a heterogeneous group of infections with a varied epidemiology, clinical features and control measures. The causative organism may be viral, bacterial, fungal, protozoan, or parasitic' (HPA, 2009).

The importance of zoonotic diseases is well demonstrated by a survey of infectious organisms which showed that, of the 1415 species known to be pathogenic to humans, 61 per cent (868) are zoonotic, while 75 per cent of diseases considered to be 'emerging' are also zoonotic. It is perhaps worth noting that many of the zoonotic agents causing disease in humans cause little or no obvious clinical disease in their animal hosts' (Taylor *et al.*, 2001).

There is also strong evidence to suggest that other communicable diseases, such as influenza, may have originated from non-human animals. Also the present Acquired Immuno Deficiency Syndrome (AIDS) pandemic almost 38 – 44 million people across globe are carrying infection is supposed to be the result of zoonoses, but now the virus is maintaining itself well in human population' (Cripps, 2000).

Increases in the emergence or re-emergence of animal and human infectious diseases have been evident in many parts of the world for several years (Weiss and McMichael, 2004; Gibbs, 2005; Woolhouse *et al.*, 2005) [43].

Plague is one of the most devastating human diseases of all time. Plague is caused by the bacteria *Yersinia pestis* and is transmitted to humans through the bite of a flea. Plague is carried by small rodents such as rats, mice, and squirrels, which have lived among humans and their food supplies for centuries. Plague has had an enormous impact on human civilization, effecting art, literature, culture, and even human populations. The causative organism, *Yersinia pestis*, was not discovered until the 1894 pandemic and was discovered in Hong Kong by a

French Pastorian bacteriologist, Alexandre Yersin. Hence, this study was undertaken to study the extent of knowledge, awareness and risks of zoonotic diseases in dairy farmers.

Materials and Methods

Sampling area and SIZ

This cross sectional study was conducted in 100 dairy farmers from four blocks of Bidar district, Karnataka state. Dairy farmers, farm labors, farm supervisor, milking man and agricultural cum dairy farmers were selected without adopting any sampling method. Each farmer was interviewed with a preformed questionnaire.

Data collection

Questionnaire Preparation and Measurement of Variables

The questionnaires were prepared based on the two important criteria as follows

- Demographic distribution
- Association with animals
- Awareness on cattle zoonotic diseases
- Personnel hygienic and sanitary measures

Demographic Distribution

This important aspect of the study includes various factors as follows

- Age
- Sex
- Occupation
- Educational
- Economic Status

Association with Animals

This includes various variables as follows such as

- Dairy farm size
- Working experience in dairy farming
- System of rearing

Awareness on Cattle Zoonotic Diseases

- Mode of transmission, Specific knowledge on zoonotic diseases
- Symptoms of zoonotic disease in animals and humans
- First aid treatment and preventive measures
- Awareness on deworming

Personnel Hygienic and Sanitary Measures

- Name of the disinfectant usage in dairy farming and hand washing
- Frequency of dairy farming and hand washing with disinfectant
- Personal protective measures while handling of animal and animal wastes
- Cost of expenditure towards treatment of sick animals and humans

Method of data collection

Draft questionnaires were prepared based on the above mentioned criteria as pilot study and those drafts were distributed to three experts for corrections. After the corrections from the experts, a final questionnaire was prepared. The designed questionnaires were distributed to the 100 selected populations (Dairy farmers and Agricultural cum dairy farmers) and collected back after giving a sufficient time period. The data were subjected to statistical analysis.

Statistical analysis

Data obtained through the questionnaires were subjected to statistical analysis by Percentile analysis method.

Results

A cross sectional study was conducted in 100 dairy farmers from five taluks of Bidar district, Karnataka state. Dairy farmers, A.I workers, agricultural cum dairy farmers and daily wage farm laborer by random sampling method for assessing awareness on cattle zoonotic diseases. Data were collected from each respondent with a preformed questionnaire. Results are tabulated with the following titles.

Demographic distribution details

Demographic details were collected from 100 dairy farmers and results are tabulated (table 1).

Table 1: demographic details of dairy farmers

Particulars	Classification	No. of respondents	Per cent
Age	Less than25	17	17
	26-50	73	73
	51-100	10	10
	Total	100	100
Sex	Male	77	77
	Female	23	23
	Total	100	100
Educational status	Nil	4	4
	Primary	13	13
	Sslc	41	41
	Hsc	31	31
	Graduate	9	9
	Post graduate	2	2
Occupation	Total	100	100
	Dairy farmer	29	29
	Agricultural cum dairy farmer	71	71
Socio economic status	Total	100	100
	Lower(<50,000)	55	55
	Middle(50,000-1,00,000)	25	25
	Upper(>1,00,000)	20	20

Number of animal, experience, system of rearing

Out of 100 dairy farmers data were analyzed and found that 67 per cent farmers had less than 5 dairy cow in his farm, 12 per cent dairy farmers having less than 5 years' experience in dairy farming and 69 per cent respondents followed semi intensive method of cattle rearing (Table 2).

Table 2: No. of animal, dairy experience, System of rearing

Characteristics	Classification	No. of respondents	Per cent
No. of animals	<5	67	67
	>10	22	22
	>20	07	07
	>50	04	04
	Total	100	100
Experience (Yrs.)	<5	12	12
	5-10	49	49
	>10	39	39
	Total	100	100
System of rearing	Intensive	7	7
	Semi intensive	69	69
	Extensive	24	24
	Total	100	100

Awareness and deworming status on cattle zoonotic diseases

Present study revealed that 74 per cent and 77 per cent dairy farmers are aware about deworming and zoonotic diseases

respectively. Out of 77 per cent respondents rabies (77.3 per cent), FMD (62.0per cent), tuberculosis (18.1per cent), anthrax (16.8per cent) and brucellosis (11.6 per cent) are aware about zoonotic diseases (Table 3).

Table 3: Awareness and deworming status on cattle zoonotic diseases

Awareness Status	Deworming	Zoonotic diseases	Diseases	No. of respondents	Per cent
Yes	84 (84 per cent)	81 (81 per cent)	Rabies	76	93.8
			FMD	70	86.4
			Tuberculosis	34	41.9
			Anthrax	07	8.64
			Brucellosis	43	53.0
			Echinococcosis	00	00.0
			Salmonellosis	04	04.9
			Leptospirosis	01	01.2
			Ring worm	01	01.2
			Listeriosis	01	01.2
			Taeniasis	00	00.0
Q-fever	00	00.0			
E.coli	00	00.0			
No	16 (16 per cent)	19 (19 per cent)			
Total	100	100			100

Hygienic and disinfection awareness on cattle zoonotic diseases

Hygienic and disinfection awareness data were collected and results are tabulated. In the present found that out of 100 dairy

farmers 35, 42, 81 and 79 per cent are aware on usage of disinfection, personnel protective measures, frequency of disinfection usage in hand washing and frequency of livestock shed cleaning respectively (Table 4).

Table 4: Hygienic and Disinfection awareness on zoonotic diseases

Category	Awareness status	No. of respondents	per cent
No. of usage disinfection	Yes	35	35
	No	65	65
Total		100	100
Personnel protective measures	Yes	42	42
	i. Gloves	19	45.2
	ii. Face mask	07	16.6
	iii. Apron	00	00.0
	iv. Gumboot	10	02.3
	v. Head cap	06	14.2
	No	58	58.0
Total		100	100
Frequency of disinfectant usage for hand wash	Yes	81	81.0
	i. Daily	39	48.1
	ii. Frequently	22	27.1
	iii. Weekly	07	08.6
	iv. Whenever	13	16.0
	No	19	19.0
Total		100	100
Frequency of livestock shed cleaning	Yes	79	79.0
	i. <1 time	29	36.7
	ii. 2 times	32	40.5
	iii. 3 times	18	22.7
	iv. 4 times	00	00.0
	No	21	21.0
Total		100	100

Immunosuppressive persons involvement status in farm activity

Presence of Immunosuppressive persons likes patient,

pregnancy, smoking, alcoholic labours in the farm were analyzed and the results are given (Table 5).

Table 5: Immunosuppressive person’s involvement status in farm activity

Persons involved in dairy farm	Immunosuppressive category	No. of respondents	per cent
Yes		57	57
	i. Patients	02	3.50
	ii. Pregnancy	03	05.20
	iii. Smoking	33	57.89
	iv. alcoholic labors	19	33.33
No		43	43
Total		100	100

Vaccination awareness status against zoonotic diseases

Out of 100 dairy farmers 11 per cent and 89 per cent farmers are aware about vaccination status and vaccination on specific zoonotic disease of FMD respectively (Figure1 and Figure 1.1).

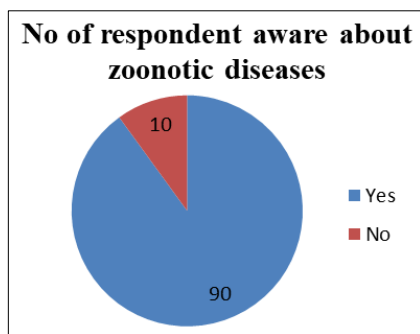


Fig 1: Vaccination awareness status against zoonotic diseases

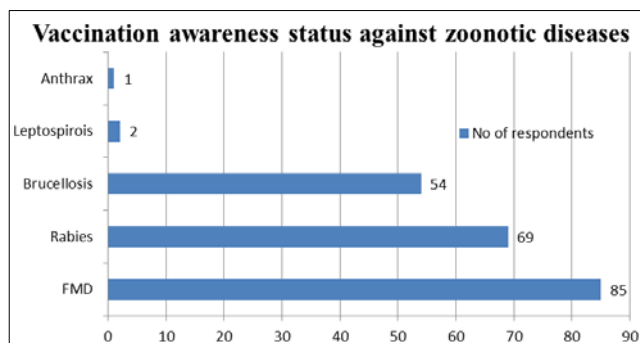


Fig 1.1: Vaccination status on specific diseases

Screening status the dairy cattle for zoonotic diseases

Among 100 dairy farmers 19 per cent farmers are screened the dairy cattle for zoonotic diseases and 27 per cent people are never done any type of screening for rule out the zoonotic diseases (Figure 2)

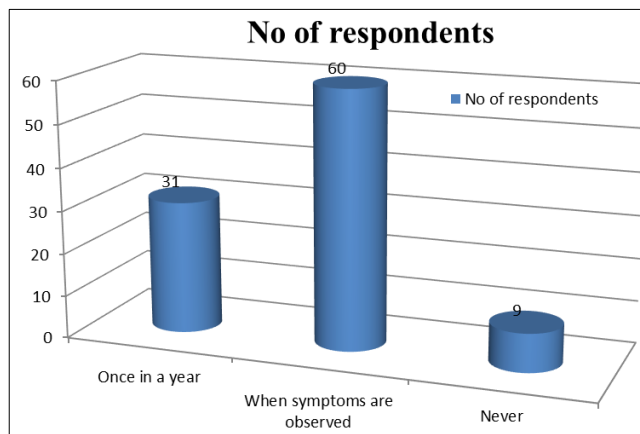


Fig 2: Screening status the dairy cattle for zoonotic diseases

Expenditure towards treating the diseased animals and sick persons

Out of 100 dairy farmers 45 per cent respondents were spending amount Rs.751-1000 and 48 per cent respondents were spending amount above Rs.1000 for treating the disease per year /animal/person (Figure 3 & 8).

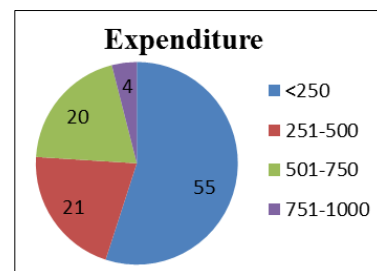


Fig 3: Expenditure towards treating the diseased animals

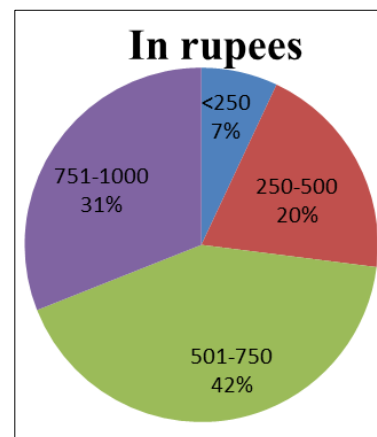


Fig 8: Expenditure towards the sick person treating the disease

Awareness about route of transmission of zoonotic diseases

A total 100 respondents were asked about the awareness on consumption of raw Milk/dairy product/handling aborted contents and found that 77 per cent respondents are aware of route of transmission of zoonotic diseases and also knew ingestion (49 per cent) is the major route of transmission (Figure 4 & 4.1)

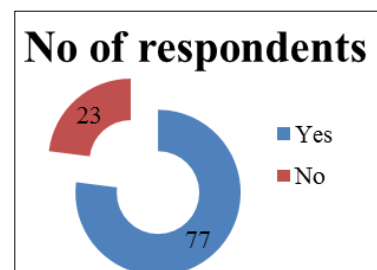


Fig 4: Awareness about route of transmission of zoonotic diseases

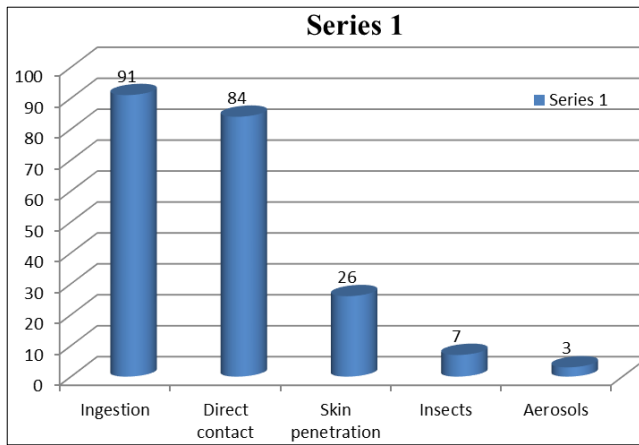


Fig 4.1: Awareness level about zoonotic diseases transmission

Involvement of animal husbandry activities

Involvement of Animal husbandry activities among the sample respondents was categorized into farm labour, farm supervisor, milking man and others like visitors, agricultural field workers (Figure 5).

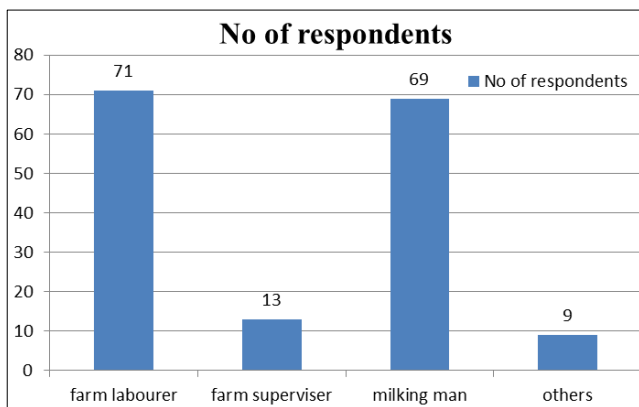


Fig 5: Involvement of Animal husbandry activities

Source of getting awareness about the zoonotic diseases

The sources of getting awareness about the Zoonotic diseases were analyzed and the results are given (Figure 6)

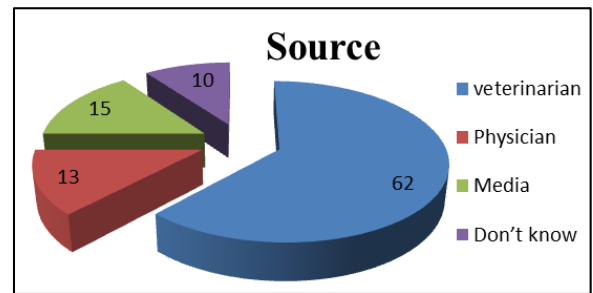


Fig 6: Source of getting awareness about the zoonotic diseases

History and signs of cattle zoonotic disease

History signs among the respondents were analyzed among the 100 respondents found that 42 dairy farmers showed for signs of cattle zoonotic diseases (Figure 7) and different clinical signs are given (Figure 7.1).

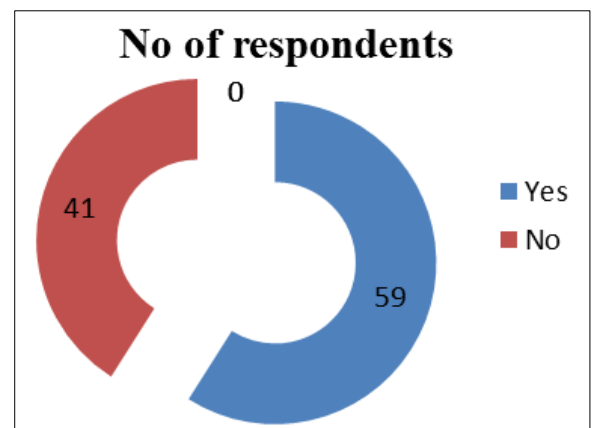


Fig 7: History and signs of cattle zoonotic disease

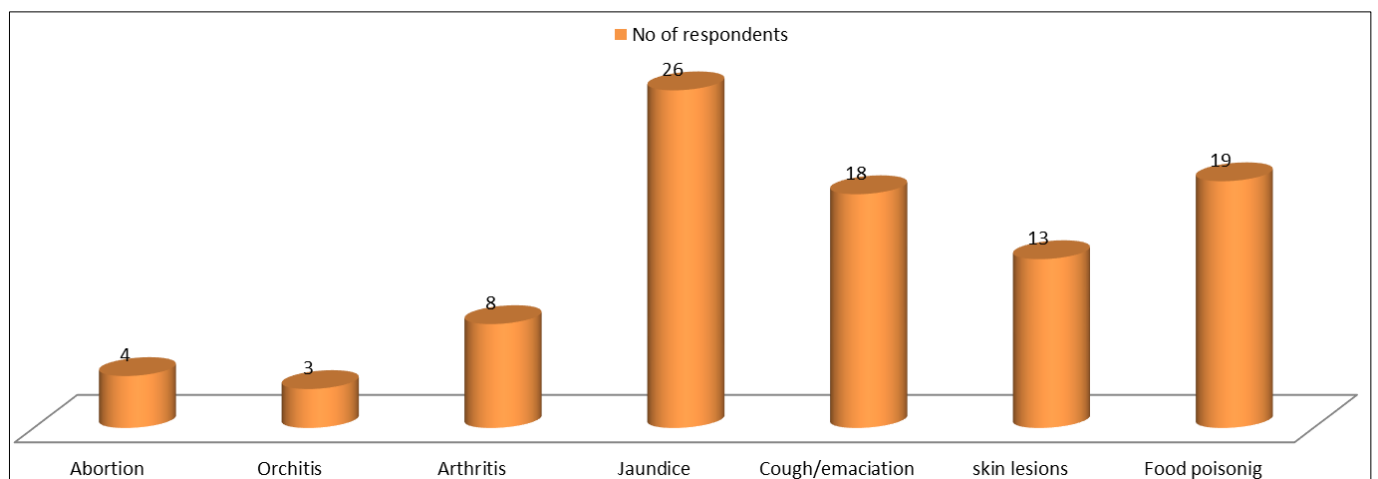


Fig 7.1: History and signs of cattle Zoonotic disease

5. Discussion

Demographic distribution details

In the present study, demographic details were collected from 100 dairy farmers and found that 85 per cent were belonging to 26-50 years age and 73 per cent were male. Only 25 per cent farmers did schooling. The farmers had an annual income in the range of Rs.50, 000-1,00,000 through agricultural cum dairy farming. Hundal *et al.* (2016) [19] also reported that

majority of the respondents had age up to 40 years (70 per cent) and their qualification of primary to higher secondary level (77.6 per cent). Rajkumar *et al.* (2016) [29] found in his study that most of the respondents were small-scale farmers and their monthly income was less than Rs. 10,000. Based on the results of the study it is suggested that better correlation can be drawn out only by collecting data from large number respondents.

Number of animal, experience and system of rearing

Out of 100 dairy farmers data analyzed in the study, 53 per cent farmers had less than 5 dairy cow in their farm, 57 per cent dairy farmers having less than 5 years experience in dairy farming and 59 per cent respondents followed semi intensive method of cattle rearing. Hundal *et al.* (2016)^[19] revealed in his cross sectional study their herd size up to 10 animals (79.6 per cent). Tebug (2013)^[39] revealed 81 respondents had above six years' experience in dairy farming.

Awareness and deworming status on cattle zoonotic seases

Present study revealed that 74 per cent and 77 per cent dairy farmers were aware about deworming and zoonotic diseases, respectively. Out of 77 per cent farmers rabies (77.3 per cent), Foot and Mouth Disease (FMD) (62.0 per cent), tuberculosis (18.1 per cent), anthrax (16.8 per cent) and brucellosis (11.6 per cent) were aware about zoonotic diseases. Chikerema *et al.* (2013)^[10] found that awareness amongst the farmers was known *viz.*, rabies (88.7 per cent), anthrax (71.5 per cent) and brucellosis (20.9 per cent). Tesfaye *et al.* (2013)^[40] revealed that were rabies (97.1 per cent), followed by taeniasis (83.4 per cent), anthrax (55.4 per cent), bovine tuberculosis (29.1 per cent) and hydatidosis (4 per cent) knew on common zoonotic diseases. Also Girma *et al.* (2012)^[16] reported that majorities of respondents were frequently mentioned zoonotic diseases were Rabies 384 (100 per cent) followed by Anthrax 362 (94.27 per cent), Teniasis 342 (89.06 per cent), Tuberculosis 340 (88.54 per cent), Brucellosis 190 (49.48 per cent) and 120 (31.25 per cent) mentioned other infectious diseases of zoonotic importance. The lower per cent in our study might be attributed to the fact that some of the farmers included in the present study were illiterate and also may be due to lower number of respondents.

Hygienic and disinfection awareness on cattle zoonotic diseases

Cross sectional survey were collected from 100 dairy farmers in that 45, 78 and 64 per cent were aware on usage of disinfection, frequency of disinfection usage in hand washing and frequency of livestock shed cleaning, respectively. Majority of the farmers (59.3 per cent) cleaned the shed two times per day with suitable disinfection. A total of 55 per cent and 62 per cent farmers have not used any disinfection and personal protective measures to prevent incidence of zoonotic diseases. Our results were correlated with Rajkumar *et al.* (2016)^[29] interviewed with 250 livestock farmers on zoonotic diseases awareness and found that about 61.2 per cent of farmers were keeping their animal shed clean. Also reported that overall hygienic practices followed by the farmers during cleaning of udder while milking and during cleaning of sheds were also considered to be negligible Babu *et al.* (2015)^[4]. Our results correlated with Tebug *et al.* (2015)^[38] 70.3 per cent of farmers regularly assist animals during parturition and abortion without protective gloves. A majority of the respondents did not use any protection when handling cows having an abortion or when dealing with aborted materials (Lindahl *et al.*, 2015)^[23].

Immunosuppressive persons involvement status in farm activity

It was observed that out 100 farmers interviewed only 22 per cent any one the immunosuppressive farmers involved in dairy farming. Also our study revealed that 11 respondents had habits of smoking in dairy farm. Only limited studies

have been carried out to assess the immunity status of persons involved in dairy farming.

Vaccination awareness status against zoonotic diseases

A total of 19 per cent and 81 per cent farmers were aware about vaccination and its importance and vaccination was done on specific zoonotic disease like FMD respectively. Hundal *et al.* (2016)^[19] revealed that annual vaccination of dogs (78 per cent) against rabies and only 47.2 per cent livestock owners were aware of the occurrence of abortion due to brucellosis and availability of prophylactic vaccine (67.6 per cent) against it as a preventive measure. Our results correlated with Tebug, (2013)^[39] significantly higher number of respondents (75.7 per cent) had satisfactory level of awareness when compared to those who practiced preventive measures.

Screening status the dairy cattle for zoonotic diseases

Among 100 dairy farmers 29 per cent farmers were screened the dairy cattle for zoonotic diseases and also 49 per cent farmers have never done any type of screening to rule out the zoonotic diseases. Majority of the dairy farmers were illiterate and never heard about zoonotic diseases that's may be the reason for not screening the dairy cattle for zoonotic diseases in our study.

Expenditure towards treating the diseased animals and sick persons

Out of 100 dairy farmers 44 per cent and 48 per cent were spending Rs.751-1000 for treating the disease per year /animal/person. Our preliminary study couldn't correlated with other studies due to lack of relevant data and only limited research have been carried out to assess expenditure details for treating the persons/ and animals.

Awareness about route of transmission of zoonotic diseases

A total 100 respondents were asked about the awareness on consumption of raw milk/dairy product/handling aborted contents and found that 56 per cent respondents were aware of route of transmission of zoonotic diseases and also knew ingestion (55 per cent) was the major route of transmission. Hundal *et al.* (2016)^[19] opined that 55.6, 67.2, 52.0, 64.0 and 51.2 per cent respondents were aware of the transmission of zoonotic diseases to human being through contaminated milk, meat, air, feed, or through contact with infected animals, respectively. Rajkumar *et al.* (2016)^[29] revealed only 16.4 per cent of respondents knew that diseases in animals can be transmitted to humans through any one of the route. Babu *et al.* (2015)^[4] also found that transmission of zoonotic diseases through consumption of milk (14.10 per cent) and meat (18.58 per cent).

Involvement of animal husbandry activities

Involvement of Animal husbandry activities among the sample respondents was categorized into farm labour (68 per cent), farm supervisor (21 per cent), milking man (19 per cent) and others (11 per cent) like visitors, agricultural field workers. Tesfaye *et al.* (2013)^[40] conducted a face to face interview technique with farmers (n=48), smallholder dairy farmers (n=44), butchers (n=34) and city residents (n=49) for assessing the perception of the public on common zoonotic diseases and found that the most frequently known zoonotic diseases among the respondents in the study area were rabies, taeniasis, anthrax, bovine tuberculosis and hydatidosis.

Source of getting awareness about the zoonotic diseases

In our study revealed 33, 30 and 19 per cent received the sources of information on awareness about the zoonotic diseases from media, Veterinarian and Physician. Tebug (2013) [39] opined that most of the farmers (59.3 per cent) received information about zoonosis through Agricultural extension services. Girma *et al.* (2012) [16] conducted a qualitative survey in 384 individuals to assess the awareness on food borne zoonosis. He mentioned that (85.42 per cent) of the students got their information from other information sources like their families and 67.71 per cent of health professionals get their information from their medical schools.

History and signs of cattle zoonotic disease

History signs among the respondents were analyzed among the 100 respondents found that 42 per cent dairy farmers showed for signs of cattle zoonotic diseases. Rajkumar *et al.* (2016) [29] also reported that in his study 37.7 per cent reported respiratory infection, 31.1 per cent digestive disturbances, 15.5 per cent had dermatological problem and 15.5 per cent reported indiscrete disease such as fever, body pain, and headache joint pain. From the respondent got the zoonotic disease (n=45), 51.2 per cent of the respondent reported chronic infection and 48.8 per cent of the respondent reported acute form of zoonotic infection. About 30 per cent of the respondents' farm had an incidence of abortion. Bagaria and Sharma (2014) revealed that 86 per cent of the total participants perceived a risk of suffering from disease or injury such as Allergies, tuberculosis and bird flu due to animal handling in zoological gardens. In infected persons showed headache (83.3 per cent), itching (80.3 per cent) and nausea & vomiting (77.3 per cent) were the most commonly stated symptoms of diseases transmitted by animals.

Specific knowledge about the zoonotic disease

The 100 dairy farmers were asked about the Zoonotic diseases and their knowledge was assessed by percentile method. Similar study was done by Hundal *et al.* (2016) [19] who observed that 69.2 per cent respondents belonged to low to medium knowledge level categories, whereas 30.8 per cent respondents had high knowledge regarding different aspects of zoonotic diseases in his study.

In a study conducted by Bojiraj *et al.* (2017) [8] revealed that livestock farmers were well aware of certain zoonotic diseases like rabies and FMD but the knowledge the knowledge towards other diseases was low to medium. Even the farmers did not hear the name of few parasites and food borne zoonosis. Knowledge about diseases and symptoms about zoonotic diseases was 86.34%, followed by mode of transmission and routes 77.12%, First aid treatment 65.91% and preventive measures 55.45%.

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