RESEARCH NOTE

Assessment of Farmers' Knowledge about Safe Handling Practices of Dairy Animals

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ABSTRACT

Prevalence of zoonoses is high in India because of close contact to animals and traditional food consumption customs. Farmers are at the top of this risk because of direct contact with animals. Farmers' unawareness about the dangers of zoonoses can leads to severe health problems. Knowledge about safe animal keeping is a key to understanding how to take sensible precautions against health hazards. With the aim to assess the knowledge about safe dairy animal keeping, a cross-sectional study was conducted in four villages of district Gurdaspur. Study tool used was questionnaire containing 24 items. 200 farmers responded to the questionnaire. The analysis of data, revealed mean knowledge score for the farmers to be 15.80. Results showed significant negative correlation was between knowledge score and age of respondents. Similarly positive correlation was found between knowledge score and education status. Knowledge about safe animal keeping depends upon gender, training status and number of animals. Specific seminars and practical training of the farmers regarding safe animal keeping is needed to bring about changes in the agricultural practices in India.

Key words: *Farmers' Knowledge; Dairy animals; Zoonoses; Occupational health;*

In India, farmers have always offered respect to milk yielding animals and established a very close and respectful relationship with these animals. 80 per cent of India's population is rural and live in close contact with dairy animals. The tradition of keeping cattle inside home still exists. Zoonoses are of particular public health importance in societies that live closely together with their livestock (*Unger, 2003*). Particularly in developing countries like India prevalence rates of zoonoses in man are often high, because of close contact to animals and traditional food consumption customs (*Nicoletti, 1984*).

All dairy animals naturally carry a range of diseases some of which can also affect humans. Some of these diseases are Actinomyces pyogenes abscess, Anthrax, Babesiosis, Bovine spongiform Enceph., Brucellosis, Giardiasis, Gastrodisciasis, Leptospirosis, Lyme disease, Milker's nodes, Sarcosporidiosis, Taeniasis, bovine Tuberculosis, Q Fever etc. Epidemiological evidence shows that, in India, a very common zoonosis, brucellosis is present in different species of mammalian farm animals including cattle, goats, buffalo, yaks, camel, horses and pigs (*Renukaradhya et al, 2002*).

Zoonoses can be transmitted through direct infection or consumption of contaminated animal products and are an occupational hazard. Fresh milk and dairy products prepared from unpasteurized milk such as soft cheeses, yoghurts and ice creams may contain high amounts of the bacteria and consumption of these items is an important cause of zoonosis (*Bikas et al, 2003*). Infection also may occur through cuts and brasions of the skin, via the conjunctiva and by inhalation. These routes of infection are very important for farmers as these increase occupational risk of infection through their contact with animals and animal products (*Omer et al, 2002*). Even among those living and working on a farm there are individuals who may face additional risk for acquiring zoonotic infections and developing disease because of extremes in age, pregnancy or immune status (*Donham and Thelin, 2006*). Transmission from human to human, mainly

mother to child, has also been reported but is very rare (*Palanduz et al, 2000*). Infection during pregnancy carries the risk of abortion or intrauterine transmission of infection to the infant (*Giannacopoulos et al, 2002*).

With increasing demand for milk and derived products the possible spread of milk-borne diseases also increases (*Unger, 2003*). Increased demand for dairy products accompanied with changing and intensified dairy practices has raised the concern for increased spread and intensified transmission of this infection to the human population with increased risk of disease (*Henk and Manzoor, 2005*). The changing and fast growing dairy industry in India has resulted in intensified trade and animal movements and provides a new and increased risk in spreading the infection (*Renukaradhya et al, 2002*).

Because of wide spectrum of signs and symptoms, zoonoses are very difficult to diagnose and require laboratory testing for confirmation (*Young, 1995*). Therefore early identification of disease becomes difficult leading to severe form of disease. High prevalence appears to be due to insufficient preventive measures and the lack of adequate control programs (*Gwida, 2010*).

Zoonoses in cattle is associated primarily with poor hygiene and very basic steps like personal hygiene and the use of barrier precautions while handling animals can largely prevent spread of diseases. Knowledge about safe animal keeping is a key to understanding how to take sensible precautions against health hazards. Farmers' unawareness of the dangers of zoonoses can lead to severe health problems. Awareness of risk groups is needed to take appropriate preventive measures and to accept control measures (*Kersting, 2008*). The objective of this paper is to assess the knowledge of farmers regarding safe animal keeping which can avoid zoonoses and other occupational hazards.

METHODOLOGY

The present study was undertaken in district Gurdaspur of Punjab (India). One village was selected randomly from each of five tehsils of this district and 40 dairy farmers from each village were surveyed; hence total number of respondents in the present study was 200. All respondents were interviewed personally. Aim, objectives and any uncertainty regarding the interview schedule/Questionnaire were explained.

Based on a comprehensive review of the literature, 24 true/false/can't say type questions were designed. Of these 24 statements, 16 were worded positively and 8 were worded negatively. The questionnaire was adapted to the local language i.e. Punjabi and designed in a simple way to make it easy for the selected farmers to read and complete. The questionnaire was tested for content validity. A pilot study was done to test the various areas of the questionnaire. It was written in two pages including the cover page that contained purpose of study and researchers' name. Questionnaire was in two sections: the demographic profile and statements regarding safe animal keeping. In the first section demographic information about gender, age, education, training status and number of animals was obtained. The second section was presented in a series of statements on a three point scale of (yes, no and can't say). Questionnaire was filled by researchers for illiterate respondents.

After analyzing the responses, a score of 1 was given for the correct answer and 0 for other answers (wrong, missing or "can't say answers). Each blank space was considered a missing value. The maximum score that any respondent could obtain if all the responses were correct was 24. The knowledge portions of the data were scored and assessed as percentage scores. Data was analyzed using the Statistical Package for Social Science (SPSS) software version 16. Descriptive statistics were used to run for frequencies, mean, and standard deviation. The Independent sample t-test and one way ANOVA were used to determine whether there is a significant difference between sets of scores. A p value of <0.05 was considered significant.

RESULTS AND DISCUSSION

Profile : The results showed that males made up 59.5 per cent and females made up 40.5 per cent of sample. All the respondents were within the age range of 16 to 65 years. Maximum farmers (32%) were in the age groups of 36-45 followed by 26.5 per cent who were in age group of 46-55 respectively. Most of respondents (26.5%) were having primary education and 23 per cent of respondents were illiterate. 13 per cent of respondents were graduates. 44 per cent of dairy farmers were having animal numbers between 4-6 whereas there were only 22 per cent dairy farmers having more than 6 animals. 93.5 per cent of the respondents have not taken any training in dairy farming or safe animal rearing. Socio- demographic profile of sample is given in Table 1.

Knowledge Scores : The knowledge score of the respondents ranged between 9 and 21 with a mean of 15.80, median 16 and Standard Deviation of 2.59. Mean Knowledge scores of the respondents according to the various demographic characteristics are presented in Table 1.

In similar study by *Umar and Nura* (2008), the knowledge gap and risk reduction needs among farmers and animal handlers in Sokoto was assessed. They found a knowledge gap on etiology, mode of transmission and preventive measures of zoonoses. Respondents' place of work, educational attainment, training status on rearing or handling of livestock and number of years of experience in livestock production and handling were the consistent important determinants of the level of knowledge, attitude to and use of preventive measures against the zoonoses, which was similar to findings of our study.

Relation between knowledge and demographic characteristics of respondents : Independent sample t test was applied to compare mean knowledge scores of males and females. This revealed that there is a significant difference in knowledge score between males and females ($p<0.05$). Mean scores of males was found to be 0.82 higher than females. This may be due to the fact that culturally males are more exposed to information sources than females.

Table 1. Demographic characteristics of sample and Mean score by various demographic characteristics

Characteristics	No.	%	Score
Sex			
Male	119	59.5	16.13
Female	81	40.5	15.30
Age			
15-25	21	10.5	15.09
26-35	41	20.5	17.09
36-45	64	32.0	15.93
46-55	53	26.5	15.28
55-65	21	10.5	14.85
Educational level			
None	46	23.0	14.47
Primary	53	26.5	15.00
Middle	17	8.5	15.35
High	40	20.0	16.97
Senior secondary	18	9.0	16.44
Graduation	26	13.0	17.80
Animal number			
>6	44	22.0	14.43
4-6	88	44.0	15.99
1-3	68	34.0	16.44
Training			
Yes	13	6.5	18.84
No	187	93.5	15.58

Similarly, Independent sample t test was applied to compare mean knowledge scores of trained and untrained farmers. A significant difference was found in knowledge score knowledge score of farmers as per their training status ($p<0.05$). Farmers who got training in some form, despite less in number performed much better by scoring 3.26 higher than others.

One way ANOVA was used to compare mean knowledge scores age wise as well as qualification wise. Difference in knowledge about safe handling practices of dairy animals was found significant according to level of education as p value was less than 0.05. As far as the impact of education is concerned, on average, a farmer having primary education had 0.53 higher scores, compared to illiterate farmers. Respondent having high education had 1.97 higher scores compared to respondent having primary education. While graduates performed much better by getting 3.33 higher score as compared to uneducated farmers and 0.83 higher score than farmers having high school education. On the other hand, difference in mean knowledge scores was not found to be significant among respondents of different age groups ($p>0.05$).

Similarly, one way ANOVA was used to compare mean knowledge scores of groups of farmers as per animal numbers kept. Here p value was found to be 0.05, hence a significant difference in knowledge score was revealed. Respondents having 1-3 animals scored 0.45 higher than respondents having 4-6 animals and 2.01 than respondents having more than 6 animals. Important results of various statistical tests are provided in Table 2.

The most common forms of knowledge were disposal of dung in a pit away from house (96%) which shows good knowledge of farmers about some very common preventive measures. Dung disposal is issue of public health importance as it is not only related to zoonoses but also other environmental infections. More than 92% of farmers, in present study, were aware of definition of zoonoses which shows that large number of farmers were familiar with the fact that they are susceptible to get diseases from animals. These findings were contrary to *Chattopadhyay* et al (2006) who found that 68.2 per cent of 500 families interviewed did not

have knowledge about zoonotic diseases in rural Bengal. 89.5 per cent respondents knew that udder should be washed with warm water before milking. Table 3 highlights the most correct responses.

Six knowledge statements had a response rate lower than 50 per cent. 71 per cent of respondents considered no need of gloves to handle animal dung. Most of farmers opined that usage of gloves is just a show off commonly practiced by young girls and there is no need to adopt such measures. 64 per cent of respondents considered that there is no harm in taking fresh raw milk and were unaware of risks involved in drinking raw milk. More seriously, some considered that boiling of milk can lead to destruction of nutrients. 58 per cent of farmers did not know that milk should be discarded for human consumption if antibiotic treatment of animal is going on. 43.5 per cent of respondents considered no need to wash hands with soap every time after handling cattle and 48 per cent consider no need to avoid eating or drinking in animal area. This shows the prevalence of myths and ignorance of basic measures of hygiene which can affect health of farmers in long run. Knowledge statements with less than 50 per cent correct answers are given in Table 4.

CONCLUSION

Educated and trained farmers in our sample had significantly better knowledge about safe animal keeping. Knowledge also depends upon gender and animal number. It is however very important to note that the study did not take into consideration of more complex aspects of the work safety environment. The study is intended to serve as a starting point to facilitate a detailed and more encompassing evaluation of knowledge about safe dairy animal keeping. Livestock offers both a major contribution to the livelihood of producers but also a risk to their and to consumers' health. Infection with zoonoses is often the result of ignorance which can only

Table 2. Relation between knowledge score and demographic characteristics

Purpose	Statistical operations	P value	Significance
Relation between knowledge score and gender	Independent Sample t test	0.026	Significant
Relation between knowledge score and training status of respondents	Independent Sample t test	0.031	Significant
Relation between knowledge score and educational qualification	One way ANOVA	0.006	Significant
Relation between knowledge score and Age	One way ANOVA	0.067	Non-Significant
Relation between knowledge score and no. of animals reared	One way ANOVA	0.031	Significant

Table 3: knowledge test items more than 80% correct responses

Items	correct responses
Dung must be disposed in a pit away from man residence	96 (192)
There are some severe diseases which can spread from dairy animal to man	92.5(185)
Udder should be washed with warm water before milking	89.5(179)
Animal should be regularly checked for ticks and these should be removed immediately	86.5(173)
If milk is boiled, then precious nutrients in milk are lost	85.0(170)

Table 4: knowledge test items with less than 50% correct responses

Items	correct responses
Using gloves to remove dung is merely show off	29(58)
It is good to take raw milk immediately after milking	36(72)
Milk should be discarded for human consumption if antibiotic treatment of animal is going on	42(82)
There is no need to wash hands with soap every time after handling cattle	43.5(87)
It is okay to eat/drink/smoke in animal area	48(96)
Chemicals(pesticides) used in fodder can enter milk	49.5(99)

Data within paranthesis indicate percentages

be dealt with by education and training. Farmer's information and knowledge are central in providing a sound base for environmental and health cost reduction strategy. The control of zoonotic diseases will require a coordinated effort of public health and veterinary research as well as extension and training services which will enable farmers for primary prevention.

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