

## A QUESTIONNAIRE SURVEY ON COMMON ANIMAL HUSBANDRY AND HYGIENE PRACTICES AMONG THE SMALL SCALE LIVESTOCK FARMERS IN SUBURBAN AREA OF SYLHET, BANGLADESH

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**Abstract.** This small survey aims to explore the prevailing animal husbandry and hygiene practices among the small-scale livestock farmers of suburban area of Sylhet, Bangladesh. Small-scale farmers (n=23) were interviewed according to a semi structured qualitative questionnaire. The data was characterized according to the basic information about farmer and farm (gender, education, household members, income, farming objective and herd size). Responses for common animal husbandry questions and practices related to hygiene were analyzed to find out frequency and percentages. Males (52%) are mostly associated with farm maintenance and about 43.48% of the farmers do farming to fulfill family nutrition. 35% of the farmers are illiterate and most of them have a low income. They generally feed their animal with kitchen or market left over. The overall hygiene practice among the small-scale farmers are not that much satisfactory. Women in livestock farming have a better hygiene practices than male farmers. There is a very little veterinarian access in most of the farms. Proper investigations and understanding is the basic need to find out the actual scenario of suburban farming sector. Arrangement of root level training and awareness program for the small scale farmer is essential.

**Keywords:** *livestock, animal husbandry, hygiene, small scale farmer, calf management, women in farming*

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### 1. Introduction

In the last few decades, people living in poverty around the world have increased and a significant number of them earn by primary production activities living in the rural areas. About 690 million peoples are recorded as primary producers where they earn less than 2\$/day and 610 million of them are small-holder farmers (McKague & Oliver, 2012). Livestock farming serves in multiple ways, such as food, manure, income, hauling services, savings and insurance, social status, social capital for the small scale farmers of developing countries (Bebe *et al.*, 2003; Moll, 2005; Upton,

2004). It is recorded that livestock farming is one of the most important household income sources in this region and 68% household income depends on it (Carletto *et al.*, 2007). Besides the poor or extreme poor, billions of rural and urban households depend on this livestock sector as it is the most crucial source of nourishment (milk and meat) for them. The importance of this multipurpose sector is increasing day by day to meet the food demand because of the world population explosion (Bruinsma, 2017; Herrero, 2009; Fonseca *et al.*, 2012). Providing us with food and security this sector has a very sensitive relation both for human-animal (health and income) and environment. As stated in different research articles livestock is a potent reservoir of different pathogenic organisms that could bring devastating health effects both for animal and human, unless proper husbandry and hygiene are practiced (Zambrano *et al.*, 2014; Hermans *et al.*, 2012; Oberhelman *et al.*, 2003; Singh *et al.*, 2013; Belongia, 2003). Now the most alarming issue is that small-scale farmers from developing countries which comprise the largest traditional livestock farming system are mostly undereducated and have no proper training. They manage their farm with the old-traditional way without any concept or concern of modern and healthy farm management. Sometimes, these farmers from rural-semirural areas of developing countries have the facilities but do not follow the proper hygiene as they are not well-educated about the consequences of unhealthy farming system (Somphou *et al.*, 2008). With or without knowledge, this is why the livestock farming has always remained a sensitive area. Bangladesh has one of the highest cattle densities (Karim, 1997). About 61.7% rural households and 13.5% of urban households in Bangladesh raise livestock (Pica-Ciamarra *et al.*, 2011). These suburban and urban regions are at higher risk of disease transmission to the people of all age groups due to poor animal husbandry practices (Grace *et al.*, 2012; Slingenbergh *et al.*, 2004). This small questionnaire survey made some effort to determine the common hygiene and animal husbandry practices in the suburban area of Sylhet, Bangladesh. These practices may differ from farm to farm and might be associated with farmer's knowledge, gender, education and income.

## 2. Method

**Survey area and farm selection:** This survey was conducted in randomly selected local small-scale household farm of suburban area of Sylhet town that raises only cattle. Initially, some local known dairy farmers were contacted about the survey and their farms were investigated. Using their references total 40 small-scale dairy farmers was listed for the rest of the survey. After the final interview and survey of the listed farms, 17 farmers were culled from the survey result. Finally, this survey came out with a small data set of 23 best suited farmers.

**Questionnaire survey and data collection:** A semi-structured survey questionnaire was prepared and pre-tested during November-December, 2017. With some minor changes the final questionnaire was organized in 6 sections with total 80 questions that addressed mainly about: farmer's basic information, information of farm, farm management, animal health management, and breeding and hygiene practices. The interviews were conducted during January, 2018.

Each interview was conducted only after the given consent of the respondent farmer to attend the interview. The questionnaire was administered only to the farmer who directly maintains the farm.

Data was collected according to the response of the responding farmers and after proper observations of the farm by the interviewer where needed.

**Data analysis:** Result of every questionnaire was individually checked after interview. Any obscure and misunderstood questionnaire was excluded from the dataset.

A specific assessment on good hygiene practice had been done according to the responses of farmers. The assessment included six variables that are (1) Animal access to clean water, (2) Distant animal shed from the household, (3) Well drainage system, (4) Regular cleaning of animal shed, (5) Hand washing habits of farmers after handling cattle and (6) Udder cleaning practice. Farmers responded to the variables as either “yes” or “no” and their answer was marked as either “1” or “0” respectively. The total score of the variables ranges from 0 to 6 and farmers scoring 5 or 6 were marked as good hygiene maintainer.

The answers according to the questionnaire were entered into a computer spreadsheet, Microsoft Excel® (Microsoft Corporation, USA). Further descriptive data analysis like frequency, average and percentage were calculated by IBM SPSS-22.

### 3. Result

Characteristics of the 23 respondent farmers are listed in Table 1 according to the first two sections of the in-depth semi-structured questionnaire survey.

**Table1.** Characteristics of farm and farmers of the study (n=23)

<b>Gender of the interviewee farmer</b>	
Male	52%
Female	48%
<b>No. of family member</b> <b>Mean= 5.22</b>	
2-3	13%
4-5	43.44%
6-7	43.44%
<b>Educational background of the farmer</b>	
Primary	26%
Secondary	17%
Higher	22%
None	35%
<b>Farming do as</b>	
Main income	8 (34.78%)
Side/seasonal business	5 (21.74%)
Side business and Family nutrition	10 (43.48%)
<b>Monthly income (BDT)</b>	
Low (5000-10000)	10 (43.48%)
Middle(11000-30000)	8 (34.78%)
High(>30000)	5 (21.74%)
<b>Herd size</b> <b>Mean=6.91</b>	
2-6	16 (69.57%)

7-11	2 (8.7%)
12-16	2 (8.7%)
17-21	2 (8.7%)
≥22	1 (4.3%)

Farmers, who raise only cattle, were kept for the survey and the minimum number of cattle was 2. About 52% male and 48% female farmer of different age group responded in the survey. A significant amount of farmers (34.78%) that is 8 out of twenty-three had no educational background. All of the farmers reported having farming experience of more than 2 years at least. Most of the households have five or seven family members and this range is between 2 to 7. Only 34.78% of the farmers do farming as main source of income and rest of the farmers do farming for a mixed reason (side business and family nutrition). Their actual professions were like day labor, stone supplier, guard, tea gardener, shop keeper etc. None of the farmers shared same household with cattle although 43% of them had adjusted animal shed with their house.

**Animal husbandry practices:** The livestock housing system in the interviewed farms showed that ten farmers (43%) kept their livestock in an adjust shed that is merely separated by a wall from their living space. Tin was found as common material (22/23) for shed roof and concrete made floor was found in the majority of the animal shed (60.87%) followed by earth and brick (30.44% and 8.67%, respectively). A distribution list (frequency and percentage) of animal shed type including bedding materials and supplemented feed is presented in Table 2.

**Table 2.** Distribution of available animal shed, supplemented feed, bedding materials among the interviewee farmers (n=23)

	Frequency	Percentage
<b>Shed type (Location of the shed)</b>		
Adjust	10	43.50%
Distant	13	56.50%
<b>Shed floor made of</b>		
Concrete	14	60.87%
Brick	2	8.696%
Earth	7	30.435%
<b>Shed roof made of</b>		
Tin	22	96.65%
Concrete	1	4.35%
<b>Bedding materials for cattle</b>		
Edible	8	34.78%
Not edible	1	4.35%
None (Not available)	14	60.87%
<b>Supplemented feed</b>		
Packet	0	0.00%
Home/market left-over	16	69.57%
Both	7	30.44%

**Table 3.** Distribution of common animal health management practices among the farmers (n=23)

	Frequency	Percentage
<b>Animal health checkup interval</b>		
Regularly (6 months)	5	21.70%
Yearly	1	4.30%
When needed	17	73.90%
<b>Checkup budget</b>		
Available	3	13%
Not available	20	87%
<b>Response to sick animal</b>		
Immediate	14	60.86%
Wait for few days	9	39.13%
<b>Diagnosis</b>		
Self	12	52.17%
Local pharmacist	2	8.70%
Veterinarian	9	39.13%
<b>Primary treatment type</b>		
Local herbal	4	17.39%
Local pharmacist	8	34.78%
Veterinarian	11	47.83%
<b>Behavior to sick animal</b>		
Try to cure	18	78.26%
Kill	1	4.35%
Sell	4	17.39%

**Table 4.** Distribution of practice related to reproduction and calf management (n=23)

	Frequency	Percentage
<b>Impregnation</b>		
Natural	5	21.74%
Assisted/Vet-assisted	15	65.22%
Both(Assisted+Natural)	3	13.04%
<b>Calving site</b>		
Indoor	12	52.18%
Outdoor	7	30.43%
Both	4	17.39%
<b>Calving materials</b>		
Straw	5	21.74%
Sack	12	52.17%
Polythene	3	13.04%
None	3	13.04%
<b>Calf movement restriction</b>		
No restriction	4	17.39%
Few minutes	12	52.17%
Days (1 to few)	7	30.44%
<b>Colostrums knowledge &amp; feeding</b>	23	100%

**Animal health and calf management:** In total, eight farmers (34.78%) out of twenty-three mentioned positively about regular health check up for their cattle. They do so in different interval, and without regularity they consult with a vet or local pharmacist only when an animal fell sick. Table 3 is organized with a detail of animal health check-up interval, consultancy level of farmers with vet/pharmacist etc.

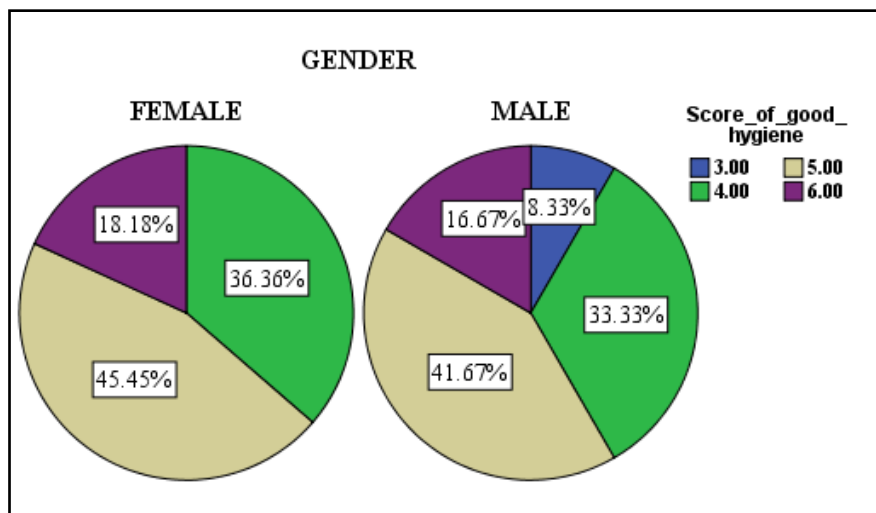
With a very few response for fixed check-up budget most of the farmers try to treat their cattle by themselves in the primary stage. Some of them use local herbs as primary medications.

All of the farmers responded positively about colostrums feeding to the calves although majority of them were not so strict about calf movement just after birth. They answered different questions about breeding procedure and calving system that is listed in Table 4.

**Good hygiene practices:** Investigation upon different question about good hygiene practice revealed that 100% of the farmers maintain a healthy manner of regular animal shed cleaning and hand washing practices. Most of the farms are located with well drainage system (87%) and a majority of them (82%) follow the practice of udder cleaning. The response about animal shed location and clean water access for animals left this survey with a great concern. Only 47.8% of the farms had arrangement of clean water for animals. Almost same number of farmers mentioned about having no different animal shed.

Their answers were calculated to make a score list where the least score was 3 with a higher risk of health hazards. Most of the farmers scored 5 and a few with a full score (6) for good hygiene practice. 34.8% of the farmers got only 4 marks and this is remarkably bad condition of hygiene.

A comparing performance by the male and female farmer is represented in Fig. 1.



**Figure 1.** Presentation of score for good hygiene performance according to gender

Upon further analysis of the data, we found female as the best good hygiene performer than male farmer. The female farmers did not have a good score only they did not score less than 4 also.

#### 4. Discussion

It is a common practice to produce small-scale livestock in the households of different developing regions (urban, peri-urban/suburban) of world (McKague & Oliver, 2012; Pica-Ciamarra et al., 2011). Although this practice is increasing for various reasons, the ultimate issue is to meet the increased food demand and demand for nutritious food by the middle class households (Lowenstein et al., 2016; Lock, 2001; Peeling & Holden, 2004; Singh, 2001). This survey met the similar concept where majority (43.48%) of the small-scale households does farming as a reason to fulfill the family nutrition demand besides extra income. The second majority (34.78%) mentioned farming as their main income source following the rest who do farming only for extra income (21.74%). As mentioned before, livestock rearing serves in many ways and is done for many purposes which may vary depending on circumstances. A survey in the urban and peri-urban regions of Kisumu municipality, Kenya found the main reason for keeping livestock is as source of income (97%) and 32% of the households had no further engagement without livestock farming in other enterprises (Kagira & Kanyari, 2010). In our survey, family members range from 4-7 persons in most of the households (87%). The average number of family member is 5.22 that are similar with the research output done in Cambodia (Osbjør et al., 2015). We interviewed the person who directly takes care of the livestock. This revealed that male (52%) are ahead than woman with a slight difference in case of responsibility for cattle rearing which again matches with the previously mentioned research of Cambodia.

Livestock rearing in or around the households is an ultimate threat of public health as it is considered as the potent source of animal transmitted disease (Seré, 1995; Montovani, 2000). This risk is higher in urban and sub-urban areas because of high population density. Besides lack of proper knowledge of animal handling and cohabitation with animal can make it even larger risk (Somphou et al., 2008). Different reports and data show a large number of human deaths in different regions of world that has caused by animal-transmitted disease (World Health Organization, 2011; Yuen et al., 2005; Hien et al., 2004). The survey we made here did not find any such cohabitation with cattle in the same household. The risk factor that we found in this part is the adjust animal shed with the households. Besides the education level mentioned by the farmer where 35% of them had no educational background at all could be a potential risk factor. It is a matter of great concern that an alarming amount of farmers scored very poor for good hygiene practice. Now, this score cannot be bypassed as it is directly connected to production quality of the farm and overall health status which is the most valuable finding of this survey.

It is mentioned in several research that illiteracy or lack of knowledge and training is a serious risk factor in case of animal management practice (Somphou et al., 2008). The major constrain of good hygiene practice were found to be shed location and clean water access for animal. Although good hygiene practice did not find any preferable relation between education level of the farmers, gender difference of farmer came out with a remarkable point. We found that women do better hygiene practice in overall basis. The entire female respondent scored an average mark and none of them scored any lowest score. On the contrary, male scored below average than female and 8% of them scored the lowest mark (3 out of 6). Finally, we came out with that women play a significant role in livestock farming with a better performance rate (Rathod et al., 2016).

On the contrary, it could not be concluded that diminishing knowledge gap can mitigate the farmer's behavior or lack of good hygiene (Alarconet et al., 2014). Now, the insignificant correlation between good hygiene practice and education of our survey meets the description of some previous survey (Hickler, 2007; Ly et al., 2007). According to those result there is a knowledge-to-action gap as attitudes and norms are influenced by various background factors (Osbjert et al., 2015).

There is a limitation of productive knowledge and income enhancing dairy practice in the traditional farming techniques of developing countries. This small-scale farmers maintain their farm with a very little cash where preventive measure, extra care or regular veterinary care for their livestock sounds like an exact luxury to them (McKague & Oliver, 2012). With an affirmative respond to this truth we found no farmers to be dependent on packet feed or regular feed supplement and a very few (13%) maintaining a fixed health check-up budget for their livestock. Only a negligible number of them maintain a regular health check-up for their livestock but with a discrete interval. The majority of the farmers feed or supplements their livestock with kitchen or vegetables market left-over like other small-scale farmers (Peeling & Holden, 2004). Saadullah M., (2001) mentioned the same feeding practice among the small-scale farmers where he found 50% of them relying on natural mating (Saadullah, 2002). According to that report the increasing trend of AI and assisted breeding is a well established practice now in our survey.

In case of response to sick animal, majority of the answers were immediate action with self diagnosis by the farmer himself where a significant amount treating their animals primarily with the help of local pharmacist. This section is an important finding of our survey that is a potential risk factor for ultimate health hazards for human as this could lead to drug resistant through animal food products (Roess et al., 2013; Lowenstein et al., 2016).

All of the farmers allow their cattle for grazing in the local lands where four farmers reported that they allow free roaming and do not look after while or where their cattle graze. This type of free grazing without awareness of the farmer can bring serious health issues of zoonoses. Similar report about relationship between hazards and free roaming animal in the road is mentioned in an Indian study (Singh et al., 2013). Calving pen is very uncommon for small-scale farmer as well as in these developing countries. Generally farmers lay straw, sack or polythene on floor during calving. In our survey, we found 3 farmers not using any kind of protection or calving materials during calving. Maximum farmers (52.18%) prefer indoor as calving site and 17.39% has no choice over indoor or outside calving site. According to the resulted questionnaire there is no actual restriction over calf movement unless for few minutes to hours in this farms. All of the respondents knew about and maintained colostrums feeding as per as their responses. Majority of the farmers had no control over weaning of the calf and they let the calves wean off naturally.

As the major limitation of this survey is having a small data size, we cannot conclude certainly that our outcome reflects the scenario of overall country. Random farm selection may affect our result in a significant manner. Despite many qualitative limitations this survey came out with the risk factors for small scale farmers like knowledge gap, absence of training program and adequate veterinarian help for root level farmers that ultimately responsible for poor hygiene maintenance of these farm.



## 5. Conclusion

Appropriate and thorough understanding for the lacking behind poor hygiene and improper livestock maintenance need more attention and proper interventions. Different training and workshop must be operated to mitigate the knowledge to action gap and raise farmer awareness for the small-scale farmers. Ensuring veterinarian access, at least an easy contact process to the root level farms would be the major step to the establishment of healthy farming policy.

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