Research Article

Management Practices of Pet Dog among a Representative Sample of Owners in Sylhet, Bangladesh

Md. Shahidur Rahman Chowdhury[1], Md. Alamgir Hossain[1], Md. Rafiqul Islam[1], Md. Bashir Uddin[1], Md. Mukter Hossain[1], Md. Masudur Rahman[2], Md. Mahfujur Rahman[1*]

[1]Department of Medicine, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Sylhet, 3100, Bangladesh; [2]Department of Pathology, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Sylhet, 3100, Bangladesh.

Abstract | The study was conducted to determine the management practices of pet dog performed in Sylhet city, Bangladesh which will assist in future research to set a proper management strategy for pet dogs. A total of 20 lead kennel owners have been selected for this study. A structured questionnaire on management practices and disease preventive measures was completed in face-to-face interviews with the kennel owners. All the data obtained from 20 different kennel owners of Sylhet city were organized, structured and analyzed with the help of MS Excel spreadsheet. Among the 58 dogs of the kennel owners 29.31% dogs were adult male and 46.55% dogs were adult female. Among the seven types of dog breeds commonly found in Sylhet city German shepherd was 36.21%, Doberman 34.48%, Rottweiler and local 6.90%, Labrador and German spitz 3.45%, and Cross 8.61%. Majority (55%) of the kennel owners bred their dogs for both security and commercial purposes and a great number (90%) of the kennel owners used a stud for natural mating. Most of the houses (55%) were made of a mixture of wood, metal and concrete and kennel owners of Sylhet city practiced combined housing system. Rice, meat, milk, kitchen residue and other formulated foods were used as feed stuff for most of the kennels (45%) and fed their pets three times daily rather than balanced diet. Kennel owners vaccinated their adult dog timely but they were unaware of practicing hygienic and sanitary measures scientifically. These results can be used to compare similar studies across time or different places, although we suggest that future research should include study on basic needs of pet dogs in appropriate and scientific way to determine the management practices which produce optimum welfare outcomes for pet dogs.

Keywords | Management, Pet dog, Dog care, Dog welfare, Bangladesh

INTRODUCTION

Pet animal acts as a crucial element in society where they perform important role in development of children physically, mentally, and socially (Robertson et al., 2000), help the well-being of their owner to get play and exercise, help each other to compete with stress and in many countries, parents nursed pet animals as their child who have no child (Education and California State Polytechnic University, Pomona, CA, 2015). Among them dog is the principal one which play different significant roles, such

as providing assistance to the blind and disabled person and sniffers dogs used by police and customs for improving activities of the defense section of the country to detect crime (Yadav et al., 2017). They are not only a companion animal but also acts as workers (Singh et al., 2015). However, in spite of the beneficial effects there are some disadvantages of rearing pet dogs as they are living with humans and responsible for spreading zoonotic diseases if proper management practices (housing, breeding, feeding deworming, and vaccination) not done (Moskvina, 2015). Review of literatures revealed that at least 36 important

zoonotic diseases are acquired from dogs worldwide including Bangladesh (Samad, 2011) since pet share the same environment with humans and constitute an important reservoir of zoonotic diseases (Kornblatt and Schantz, 1980). In Bangladesh, dog rearing is getting popularity in urban areas than rural areas day by day but they have limited knowledge about scientific rearing system as well as proper management practices of dog. For this reason, they become infected with different zoonotic diseases and cause public health hazard.

Among all cities of Bangladesh dogs are kept as a pet animal abundantly in Dhaka city and Sylhet city by local people and elites. German shepherd, Doberman, Labrador, Rottweiler, German spitz, cross and local breed are the available breeds of dogs in Sylhet city. Many people of Sylhet city rear pet dogs but they have very limited knowledge about scientific rearing system of pet dogs which helps to combat the pet zoonoses. Therefore, the present study was attempted to provide the information how the dog owner's manage their dogs' including breeding, housing, feeding and health care management practices in Sylhet city.

MATERIALS AND METHODS

DESCRIPTION OF THE STUDY AREA
Sylhet City Corporation area is 27.36 sq km, located in between 24°51´ and 24°55´ north latitudes and in between 91°50´ and 91°54´ east longitudes (Figure 1). The city is situated on the banks of Surma River. It is bounded by Sylhet Sadar upazila on the north, Dakshin Surma upazila on the south, Sylhet Sadar upazila on the east, Dakshin Surma and Sylhet Sadar upazilas on the west. The city is consists of 27 wards and 218 mahalla (BBS, 2007).
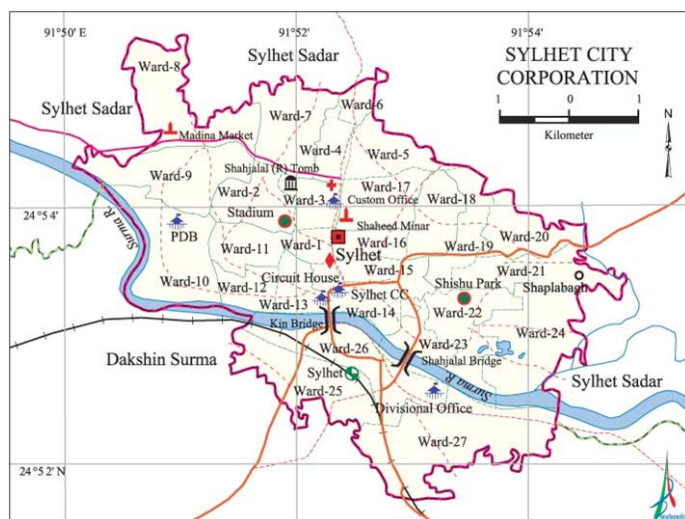

Figure 1: Map of Sylhet city corporation area, Bangladesh.

DATA COLLECTION
A total of 50 houses of pet owners were visited with the help of the secretary of Pet Lovers Association of Sylhet (PLAS)

and the owner of Knight Rider kennel from different zones (Chalibondor, Zindabazar, Dargahmoholla, Dariapara, Mirzajangal, Taltola, Pathantulla, Nayasarok, Tillagarh, Baluchar etc.) and finally select 20 lead kennel owners for this study. A structured questionnaire consisting of open and close ended questions on management practices and disease preventive measures was completed in one visit for each kennel owner where the investigator using face-to-face interviews with the kennel owners. Kennel level data included the name of kennel owner, information on the breeds kept in the kennel, population of dogs in the kennel and the purpose of kennel (security, commercial, and hobby). The questionnaire further obtained data on management of the kennels: record keeping, provision of veterinary services and the role of the veterinarian in the kennels. The data collected contained the following items: use of veterinary services and the role of the veterinarian in the kennels; the type and the frequency of disease preventive measures employed such as deworming practices (mode of administration) and ectoparasite control methods (dipping, shampooing, and spraying. Data on the type of management practice i.e. type of housing (concrete, metal, wooden); beddings (blankets, mattresses, and sacks), feeding (commercial food, rice and meat) and kennel hygiene were verified by physical inspection of the kennel during the visit.

STATISTICAL ANALYSIS
All the data obtained from 20 different kennels of Sylhet city, were organized, structured and analyzed with the help of Microsoft Corporation, 2007 windows package. The obtained information was loaded and stored on the MS Excel spreadsheet. The collected data were analyzed in a tabular form with percentage.

RESULTS AND DISCUSSION

MANAGEMENT PRACTICES OF PET DOGS IN SYLHET CITY
About 100-120 peoples rear dogs of different breed as a pet in Sylhet city. This study was conducted on 20 selected kennel owners of Sylhet city. They have collected their desired pet from Katabon and Golisthan of Dhaka; Riaz uddin bazaar, Chattogram and Zindabazar, Sylhet. They mainly choice the breed German shepherd, Doberman, Labrador, Rottweiler, German spitz, cross and local etc.

Total 58 dogs of 20 selected dog owners of Sylhet were recorded during the study period (Table 1). 29.31% dogs were adult male, 46.55% dogs were adult female, and percent of male and female puppy were same. Most of the dog owners rear dog as breeding purpose. For this reason, the percent of adult female was highest. The results are partially in agreement with the findings of (Vijayakumar, 2004). Percent of puppy was low because the owners sale puppy after 1-1.5 months of age.

Table 1: Total number of dogs of 20 selected owners.

Name of owners	No. of Animals				Total
	Adult		Puppy		
	Male	Female	Male	Female	
Arup Syam Buppy	1	2	1	1	5
Abdul Maleque	1	0	0	0	1
Ahmed Zisan	1	0	0	0	1
Azimul karim	1	2	0	1	4
Chamok De	0	2	0	0	2
Rofson gray	4	5	2	3	14
Pankaz Datta	1	1	0	0	2
Abir	0	2	0	0	2
Masnon	1	1	0	0	2
Sajon	1	1	0	0	2
Amit	1	1	1	0	3
Sajal Kanti Kar	0	2	0	0	2
Chuni Roy	0	1	0	0	1
Safiqur rahman	1	1	2	2	6
Ataur rahman	1	0	0	0	1
Gopal chakraborty	0	2	0	0	2
Rumel	1	1	0	0	2
Azhar	1	0	1	0	2
Mainuddin	0	1	0	0	1
Ariful haque	1	2	0	0	3
Total	17(29.31%)	27 (46.55%)	7 (12.07%)	7 (12.07%)	58

Table 2: Breeds of dogs commonly found at Sylhet city.

Name of the owners	Number of animals							Total
	German shepherd	Doberman	Rottweiler	Labrador	German spitz	Cross	Local	
Arup Syam Buppy	2	2	0	0	0	1	1	6
Abdul Maleque	1	0	0	0	0	0	0	1
Ahmed Zisan	1	0	0	0	0	0	0	1
Azimul Karim	0	1	2	0	0	0	0	3
Chamok De	1	0	0	0	0	1	1	3
Rofson Gray	2	8	0	2	2	0	1	15
Pankaz Datta	0	1	0	0	0	1	1	3
Abir	1	0	1	0	0	0	0	2
Masnon	2	0	0	0	0	0	0	2
Sajon	1	1	0	0	0	0	0	2
Amit	0	3	0	0	0	0	0	3
Sajal Kanti Kar	1	0	0	0	0	1	0	2
Chuni Roy	0	0	1	0	0	0	0	1
Safiqur Rahman	4	0	0	0	0	0	0	4
Ataur Rahman	1	0	0	0	0	0	0	1
Gopal Chakraborty	1	0	0	0	0	1	0	2
Rumel	2	0	0	0	0	0	0	2
Azhar	0	2	0	0	0	0	0	2
Mainuddin	0	1	0	0	0	0	0	1
Ariful Haque	1	2	0	0	0	0	0	2
Total	21 (36.21%)	20 (34.48%)	4 (6.90%)	2 (3.45%)	2(3.45%)	5 (8.61%)	4 (6.90%)	58

Total seven types of dog breeds commonly found in Sylhet city namely German shepherd, Doberman, Rottweiler, Labrador, German spitz, cross, and unidentified local breed (Table 2). The highest percent 36.21% breeds were German shepherd, followed by 34.48% Doberman, the same percent 6.90% found in Rottweiler, and local and 3.45% found in Labrador and German spitz, and cross was 8.61%. Percent of German shepherd was highest because most of the people prefer it for its attractiveness and intelligence which is in agreement with (Samms, 2003).

BREEDING SYSTEM OF DOG AT SYLHET CITY

Breeding system of dogs in Sylhet city was briefly described in this study. The result of the study showed that majority (55%) of the kennels bred their dogs for both security and commercial purposes, 35% bred for security purposes and 10% for commercial purposes only. In this study it is also found that great number (90%) of the kennels used a stud for natural mating and only 10% kennel used for artificial insemination (AI) (Table 3). The study findings regarding breeding method was very much closer to the other study (Mbindyo and Gitau, 2017).

Table 3: Data about breeding practices performed in 20 kennels containing 58 dogs.

Factors		Fre-quency	Percent-age (%)
Breeding reasons	Security	7	35
	Commercial	2	10
	Security and commercial both	10	55
Breeding method used	Natural	18	90
	Artificial insemination (AI)	2	10

HOUSING SYSTEM OF DOGS AT SYLHET CITY

Different types of housing system of dogs were observed in Sylhet city. Among them most (55%) of the houses in the kennels were made of a mixture of wood, metal and concrete as these materials are readily available, structurally sound and easy to clean (Table 4). This outcome is in line with the findings described by (Program, Maddie's® Shelter Medicine, College of Veterinary Medicine, 2015). But this finding was not in agreement with studies by (Gomez, 2010) who claimed that housing factors such as poor ventilation, presence of cracked surfaces increased risk of infection. All kennel owners of Sylhet city practice combined housing system where pregnant dog, pups and adult are kept combined which is not in agreement with the study by (Walker et al., 2016), because this type of housing system causes rapid spread of different infectious diseases. For this reason, it is said that housing system of pet dogs of Sylhet city is not scientific. The findings of this study also showed that most of the kennels (70%) provided beddings such as wooden block, cloths like jacket, rug,

ash, sand or soft dry grass which is almost closure to the findings described by (Cline, 2012) who postulated that beddings are usually used for comfort and not contribute to transmission of infectious disease among dogs.

Table 4: Information about housing system of dogs at Sylhet city.

Factors		Fre-quency	Percent-age (%)
Types of housing	Cage type housing made by a mixture of wood and metal/steel	5	25
	Mixture of metal/steel, wood and concrete	11	55
	Made by wood only	4	20
Combined/ Separate	Combined	13	65
	Separate	7	35
Provision of beddings	Yes	14	70
	No	6	30
Type of beddings	Cloths like jacket, rug	12	60
	Wooden block	8	40

FEEDING SYSTEM OF DOGS AT SYLHET CITY

In Sylhet, people fed their dog different kitchen residue (Table 5). Usually all types of food normally eaten by man are also eaten by dogs. Kitchen residue contains a combination of all cooked food. It can meet the nutritional requirement of dogs and it is not highly deficient in protein and minerals. Vegetarian diets in Sylhet are normally rich in carbohydrates and fat, but poor in good quality protein foods. Such kitchen waste should be adequately supplemented through the feeding of milk and milk products, eggs, meat and fish. The chemical composition of kitchen residue is quite variable and often inadequate to meet the requirement of dog. Thus, it is difficult to maintain the level of nutrients concentration in the diet of dogs and it is important to balance by feeding additional high nutritive value. The most of the dog owner of Sylhet fed their dog homemade foods like hotchpotch (cooked rice) with chicken viscera. Most of the home-made diets are not balanced especially for protein and minerals due to the use of larger proportions of cereals and starchy tubers and corns in the human food. Some preliminary knowledge about the nutrients requirement of dogs and nutritional composition of common dog foods is essential for the preparation of balanced home-made diets. Freshly prepared home-made diets are generally more palatable than the proprietary foods. Dog owners usually prefer to fed their dogs a standard commercial diet which is balanced and prepared specially for the dogs. Generally, three types of commercial dog foods are marketed in Sylhet.

All diets containing more than 90% dry matter at the time

of packing is known as dry food. People fed smart as dry food. It contain rice, poultry meal, corn gluten meal, soybean meal, chicken oil, beet pulp, flax seed, dried whole egg, brewer's dried yeast, lecithin, fish oil, milk replacer, iodized salt, vitamin, and mineral, food coloring and antioxidants and CP-26%, CF-4%, Fat-10%, Moisture-10%. Large-scale manufacture of good quality balanced dog foods is economical and usually it is cheapest among all the three types' commercial diets. In addition to this packaging, transport, storage and feeding of dry foods is much more convenient than the soft moist food and canned foods.

Table 5: Information about feeding practices in different kennels of Sylhet city.

Factors		Frequency	Percentage (%)
Type of feeds	Commercial	4	20
	Rice, Meat, Milk, Kitchen residue and other formulated foods	9	45
	Commercial with Rice, Meat, Milk, and Kitchen residue	7	35
Frequency of feeding per day	Once	2	10
	Two times	7	35
	Three times	11	55

Good-quality balanced and palatable diets are prepared by mixing several kinds of foods and supplements. For small-scale manufacturer it is processed by backing and for large-scale manufacturer extrusion is followed. Dry dog diets are supplied in the form of meal, kibble, flakes, water, biscuit and crackers. It is difficult to incorporate higher percentage of fat in the dry foods. Food is supplied in sealed cartons of 0.5, 1, 2, 5, 8 kg. Open cartons should be kept protected from moisture, insects and house rodents. It is also known as semi-moist or semi-solid dog food. Semi-moist dog foods contain 25-40% water. This type of food is not fed to dogs in Sylhet. People fed smart heart canned dog foods. Canned diets of dogs contain about 70-75% moisture and their shelf-life after opening the container is very short. Canned foods may be either complete balanced diet or meat preparation (protein supplement) to be mixed with cooked cereals at the time of feeding in the ratio given on the container.

Dog is basically a carnivorous animal and prefers meat and meat products (raw as well as cooked) to other. A large variety of foods can be fed to dogs without much adaptation difficulties except in some exceptional cases. A diet of cooked cereal with meat, fish of milk is quite common for the dogs. The vegetarian owners prefer to rear their pets on milk-cereal diet. A high protein and high fat diet is quite common in the feeding of dogs. When low fiber diets are fed for a long time, dogs develop a craving for fiber. This leads to their eating of cloths, grass etc. Therefore, it is necessary to provide some (4-6%) crude fiber through the feeding of bran-mixed bread, boots, fruits and vegetables etc. In early life care must be taken to provide the dog with adequate and balanced supply of the minerals necessary for bore development and blood formation and vitamins. If the diet is deficient it should be either supplemented or a mineral vitamin preparation should be administered once weekly. Now information about feeding system of dog in different kennels of Sylhet city are given below in a tabular form.

In this study it is found that Rice, Meat, Milk, Kitchen residue and other formulated foods are used as feed stuff for most of the kennels (45%) other than commercial feed which is not in agreement with other study described by (Baldwin et al., 2010; Freeman et al., 2011) because commercial food is a balanced diet rich in nutrients, palatable and easy to prepare. In this study it was also found that the dogs were fed three times daily with mixture of limited amount of Rice, Meat, Milk, Kitchen residue and other formulated foods that are not properly balanced. This study finding not satisfy the recommended feeding guideline by (Sharma et al., 2008; CDA, 2009). Providing essential nutrient needs in dogs which slows the aging process and reduces the risk for cancer, renal disease, arthritis and immune-mediated diseases in dogs (Baldwin et al., 2010; Freeman et al., 2011).

HYGIENIC MANAGEMENT AND DISEASE PREVENTIVE MEASURES PRACTICED AT SYLHET CITY

Brief information about hygiene and management practices for disease prevention of dogs at Sylhet city is shown in Table 6. In this study it is found that almost all kennel owners of Sylhet city vaccinated (URICAN-LR) their adult dogs every year against deadly diseases of pets as described by other study (Greene and Schultz, 2006; Peterson, 2006) which indicates that the owners are aware of the importance of vaccination as a disease preventive measure (Welborn and DeVries, 2011). Deworming also practiced by most of the owners and dewormed their dogs with a majority of deworming every 3 months as recommended (Miller and Zawistowski, 2013). However, the frequency of deworming varied from every three months and six months which depends on different scenarios such as potential zoonotic risks or housing conditions (Epe, 2009). This study finding was in agreement with studies by (Ahmed and Mousa, 2014; Procter et al., 2014) who noted that kenneled dogs had a high prevalence of helminths that can be asymptomatic. Inadequate deworming and irrational use of anthelmintics leads to increase parasitic infestation and anthelmintic resistance in dogs. It is also found that most of the kennel owners of the study practiced control measure against ecto-parasite as the

country environmental condition favors the growth and multiplication of ecto-parasite in hairy animals like pets. Most of them prefer dipping and shampooing their pet dogs with acaricides. These findings favor another study by (Davoust et al., 2013) who observed that animals live in same endemic areas are at risk of high mortality in the absence of efficient control methods for ecto-parasite. Ecto-parasites not only cause annoyance and irritation, but also acts as vectors of many diseases some of which are zoonotic, and an aggressive prevention strategy should be maintained for all kenneled dogs (Jones et al., 2004; Bowman, 2009). But proper timing not maintained for controlling ecto-parasite which is not in agreement with the other study (Bowman, 2009). Similarly, most of the kennel owners did not wash their kennels properly. Some of them have used soap and water to wash their kennels. This is not in line with the study by (Tarafder and Samad, 2010) who reported that poor sanitation increased the risk of infection.

Table 6: Information about hygiene and management practices for disease prevention.

Factors		Frequency	Percentage (%)
Vaccination of the dogs	Yes	20	100
	No	0	0
Frequency of vaccination	Every year	17	85
	Not maintain properly	3	15
Deworming of the dogs	Yes	15	75
	Not maintain properly	5	25
Frequency of deworming	Every three months	12	60
	Every six months	8	40
Ecto-parasite control on the dogs	Yes	18	90
	Not maintain properly	2	10
Ecto-parasite control method	Dipping	5	25
	Dipping; Shampooing	13	65
	Dipping; Shampooing; Spraying	2	10
Frequency of ecto-parasite control	Every two weeks	2	10
	Unspecified	18	90
Frequency of washing kennels	Daily	3	15
	Unspecified	17	85
Method of washing kennels	Soap and water	15	75
	Soap and water; Disinfectant	3	15
	Soap and water; Disinfectant; Bleach	2	10

Many researchers have shown that the bond that can develop between people and animals as a result of owning and caring for a pet has significant social and health benefits. Pet dogs provide companionship, a sense of purpose, and unconditional love and these qualities can especially benefit lonely, elderly, or mentally disturbed people. Different research findings have also shown that pet ownership also teaches children about responsibility, caring, and commitment. For this reason, kennel ownership carries responsibilities that should not be taken lightly as pet dogs are family members that need to be cared for throughout their entire lives, not disposable possessions that can be discarded if they become inconvenient. They also carry responsibilities for housing, quality diet, and veterinary care including routine veterinary examinations, preventive vaccinations, and parasite control.

In conclusion, management practices for pet dogs in 20 different kennels at Sylhet city are described in this study and it is found that all kennel owners are lack of knowledge about scientific rearing system of pet dogs which helps to decline the possibilities of occurring zoonotic diseases. So it is most important to maintain proper management practices for pet dogs. However due to insufficient information it might not be the exact representation. So, further advance study should include behavioral studies to determine the appropriate way of scientific rearing system of pet dogs.

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AUTHORS CONTRIBUTIONS

All authors contributed equally in the planning of the study, drafting the manuscript. All of them approved the final version of the article.

CONFLICT OF INTEREST

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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