**Chapter 1: Introduction**

Pet dog is regarded as one of the best companion animal rather than the other animals. Dogs were first domesticated more than 10,000 years ago although exactly when and where is still debated. Since then, humans have enjoyed a long parallel history with dogs during our own progression from hunter-gatherers and then farmers, to modern city dwellers (Farrell et al, 2015). Humans have kept animals as pets for at least 12,000 years. Nowadays, tendency towards rearing of pet dog is increasing day by day among the dwellers of metropolitan area due to various purposes. It has been estimated about 59% of all household in the U.S. now own pets and dogs and cats appear to be the most popular kinds of pets (Cain et al., 1985; Crispell et al., 1991). Sixty to sixty-seven percent of households own dogs, while between 30-33% own cats, not necessarily exclusively of one another (Crispell et al., 1991). It has long been an article of faith among veterinarians and canine professionals that dogs obtained as puppies from pet stores have a higher prevalence of health and behavioral problems. However, there has been a dearth of empirical studies to support this notion (McMillan et al., 2015). In a retrospective survey of the owners of 737, adult dogs found that dogs obtained from pet shops had a significantly higher prevalence of owner-directed (dominance-type) aggression and social fears (fear of strangers, children, and unfamiliar dogs) than did dogs from 5 other sources: breeders, animal shelters, friends or relatives, found or rescued off the streets, and home bred (ie, bred and reared in the current owner’s home) (McMillan et al, 2015). There are approximately 51 to 58 million dogs and 49 to 60 million cats in the United States (Crispell et al., 1991). The first commensal relationship between human beings and the ancestor of the (modern) domestic dog has evolved into a form of mutualism which, today, provides scientific evidence for the fact that the human–animal interaction benefits animals as well as people (Lynch and McCarthy, 1969; Lynch et al., 1974; Sato et al., 1993; Odendaal and Lehmann, 2000). Positive effects, ranging from physiological (Odendaal et al, 2000) to endocrinological (Hennessy et al., 1998) aspects, have been proven for dogs in association with close relationships with humans. The positive effect which animals have on people has been shown on many occasions: they have been successfully employed in the areas of well-being, preventive care and therapy (Levinson et al.,1962,1972); Rowan and Beck et al., 1994). Furthermore, animals have been employed to help people of various ages, although children and older people seem to profit the most from interacting with them (Erickson et al., 1985; Nebbe et al., 1991; Rowan and Beck et al.,1994). More than 60% of households in the United States own at least 1 pet, which accounts for >140 million cats and dogs. Similarly, more than 60% of Australian households have at least 1 dog or cat ( Laflamme et al., 2008). The widespread use of nutritionally complete and balanced commercial diets has been cited as a contributing factor for longer, healthier life spans in pets. However, there appears to be increasing interest among veterinarians and pet owners regarding use of noncommercial foods for their pets, including homemade and raw food diets. Proponents of home-prepared or raw food diets cite various benefits, including control over ingredients used, avoidance of artificial preservatives, and preservation of natural enzymes and phyto-nutrients. However, no published data are available to support an actual health benefit to pets fed such diets (Laflamme et al., 2008). On the contrary, a large study revealed a decreased incidence of numerous health problems when dogs were fed commercial foods rather than homemade diets. Research to evaluate the nutritional adequacy of homemade diets has identified a number of nutritional deficiencies. In addition, there are published case reports on the development of pansteatitis, fatal salmonellosis, and other clinical problems in pets fed homemade or raw food diets (Dammrich et al., 1991).The study is designed to determine the scientific rearing of pet dog in household aspects and identify drawbacks in different types of management practices. Therefore, the study was conducted with a view to obtaining following objectives

* Getting overall conception on rearing and management of pet dog in Chittagong Metropolitan Area in household aspects.
* Determination of scientific rearing and management of pet dog in Chittagong Metropolitan Area.
* Identification of major drawbacks in different types of management practices in rearing of pet dog.

**Chapter 2: Materials and Methods**

**2.1: Study area and study period:**

The study was designed to obtain information about the owner and the pet information, housing, feeding, grooming and washing, breeding, health care and hygienic activities information pet feeding habits, pet-owner interactions, and owner attitudes toward their pets and pet care. The study was conducted to the pet dog population of Chittagong Metropolitan area from 18th September to 20th October. It covered almost seven Thana (small part of metropolitan area) in Metropolitan area.

**2.2: Data collection:**

Data regarding on the owner and the pet information, housing, feeding, grooming and washing, breeding, health care and hygienic activities information were collected through active questioning to the owners who carried away their pet dogs to SAQTVH, CVASU for the purpose of treatment. Data is also collected by directly house visit of pet dog owner.Each question was intended to gather information regarding signalment, activities, feeding behavior, sources of information about pet care, and other information. For each pet, both open and closed-ended questions were used to identify the species, age, breed, sex, and neuter status as well as to determine the health status (ie, healthy, generally healthy, or unhealthy) and frequency of visits to a veterinarian. Closed-ended questions were used to quantify feeding behaviors and food choices provided to the pets. Multiple-choice questions wherein respondents were read questions and provided a number of choices from which to select a response were used to assess body condition, activities, and sources of information about pet care.Both healthy and unhealthy pet dog were included in the study. However, some physical examination was also performed to observe the presence of any skin lesions present in pet dog and to determine body condition score (BCS). Furthermore, it is also carried out to justify status of vaccination and deworming practices. Pet dog of all ages is included in the study. In case of multi-dog households, one of the dogs was selected at random. All the owners declared that their dogs did not suffer from any kind of physical or behavioral problems. No other selection criteria were imposed. If the pet dog had undergone vaccination and deworming program, last when vaccines and anthemintics given to pet dog was noted down in the questionnaire. In case of male pet dog, all sorts of information was collected from the owner except breeding, delivery, spaying and post delivery care information were omitted. In case of grooming and bathing, which type of shampoo and soap used was also recorded in the questionnaire. Because it helps to know which compound does the shampoo and soap contain and the compound has ability to eliminate external pathogens from the body coat of dog.

**2.3 Data analysis**

All pieces of data regarding owner information, information of pet dog, housing, feeding, breeding, health care and hygienic management activities were inserted into Microsoft Excel Sheet. Then data was analyzed by Stata 11.0 considering thirty one variables.

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**Fig-1: Map of Chittagong Metropolitan Area**

 **Fig-2: Dog pen Fig-3:Pet dog with owner**

**Chapter 3: Result and Discussion**

**3.1 Housing management**

In case of housing information, the presence of dog pen, run loose of pet dog in unfenced area and when it was loosed from dog pen and status of ventilation in dog shed were considered as variables. These variables influence the dog behavior, physiological status, health and growth of dog to a large extent. According to data analysis, seventy five (75%) owner had separate pen or sheds for their pet dog ( Table 3.1). Besides this, the pet dog also moved and played inside the room at any time of day or night period. The study found that twenty five percent (25%) owners did not manage pen for the shelter for their pet dogs (Table3.1). A well organized dog pen should have the practical working building facilities, easy to clean and use for studies. Individual buildings to avoid spread of disease, a more ‘domestic’, home-like ambience, avoidance of long corridors and rows of animals in ‘cells’, avoidance of cages and bars, feeling of light and space , access to the outside in all weathers where appropriate , provision of environmentally enriched living accommodation for the animals, provision of access for visitors to all parts of the facility, buildings that blended well into the countryside, gaining support of the local community and planning authority (Loveridge et al.,1998). Statistical analysis showed that approximately sixty five percent (65%) dog owners allow their dog to run and move in unfenced area ( Table 3.1). It means, owners accompany their pet dog when they go for shopping, jogging, visiting of family members and travelling of a tourist attraction places. Dog ran loose mainly in the night period (45%) (Table 3.1) because many stray dogs move here and there in the roadsides and ultimately street dogs may attack the pet dog during their loose outside of fenced area. Status of ventilation was identified as good in the fifty percent pet owners, fair in forty percent owners and then ten percent farm owners had poor ventilation facilities in their pet dog shed.

Table 3.1: Analyzed Stata on housing of pet dog

|  |  |  |
| --- | --- | --- |
| Variables | Category | Percentage (%) |
| Dog pen | Yes | 75 |
|  | No | 25 |
| Loose in unfenced area | Yes | 65 |
| No | 35 |
|  | Day | 25 |
| When loose | Night | 45 |
|  | NI | 30 |
|  | Good | 50 |
| Status of ventilation | Fair | 40 |
|  | Poor | 10 |

**3.2 Feeding management**

Pet dog requires balanced diet which should contain essential nutrients in term of maintenance, growth, reproduction. The pet owners of Chittagong Metropolitan Area has their own preference and choice to provide food to their pet dog. The study reveals a variety of food provided by the owners which is commercial food, kichuri, raw meat, table and human food, bone and splint, vegetables, milk and loaf. However, it discovered around eighty percent owner followed their specific feeding schedule and strategy and remaining twenty percent owner had no routine schedule to provide foods to pet dog ( Table 3.2). Moreover, fourty-five percent owners give commercial food, kichuri, vegetables, loaf and milk which is more balanced and nutritious than other foods, thirty five percent owner provide kichuri and raw meat, ten percent owners offer human table food, five percent owners provide raw flesh and finally five percent owners provide bone , splint and shank to their pet dog (Table 3.2). The reported motivations for pet owners to feed home-prepared or raw foods include many factors that may be grouped as a specific desire to pamper their pet, the need to address concerns that commercial foods may be less wholesome or nutritious than desired, or an attempt to achieve a real or perceived medical benefit. In addition, the proponents of raw food diets have suggested that raw foods provide a more natural diet that is comparable to that consumed by wild canids and felids. Home-prepared diets can provide complete and balanced nutrition when properly formulated and prepared. In addition to the risks of nutritional imbalances associated with any homemade diet, diets that include raw bones or meat may carry additional risks, such as obstruction or perforation of the gastrointestinal tract and transmission of infectious agents. Raw meat diets have been associated with a number of health risks, including zoonotic risks. Veterinarians have the responsibility of ensuring that clients understand the risks when they feed this type of food (Laflamme et al., 2008). The change in regular food item is undertaken by fourty five percent (45%) owner and remaining fifty five percent (55%) owners did not make change in regular food items. It is advisable to owner that changes in regular food items may increase the appetite of dog and adjust the stomach juice to digest and metabolize a variety of nutritious food items. The present invention meets that need by providing a pet food composition for large and giant breed puppies Which contains restricted levels of calcium and phosphorous along With a balance of other nutrients to promote proper skeletal growth. The composition also contains lower levels of fat to reduce excessive growth rates which could have an adverse affect on skeletal development. ( Dammrich et al., 1991). The study discovered that ninety percent dog owner feed their dog together and on the contrary, only 10% owners provide food separately to their pet dog. Moreover, ninety percent and eighty percent owner kept pet food on bowl and water in pot respectively whereas ten percent and twenty percent owner kept food on open floor and provides drinking water through drinker (Table 3.2).

Table 3.2: Analyzed Stata on feeding management of pet dog

|  |  |  |
| --- | --- | --- |
| Variables | Category | Percentage (%) |
| Feeding schedule | Yes | 80 |
|  | No | 20 |
| Human food | Yes | 50 |
|  | No | 50 |
|  Type of food | Commercial food, kichuri, vegetables, loaf and milk | 45 |
|  | Kichuri, rice and raw meat | 35 |
|  | Raw meat | 5 |
|  | Human table food | 10 |
|  | Shank, bone splint, bone and table food | 5 |
| Change in regular food | Yes | 45 |
|  | No | 55 |
| Feed together or individually | Yes | 90 |
|  | No | 10 |
| Where kept food | Bowl | 90 |
|  | Open floor | 10 |
| Where kept | Pot | 80 |
|  | Drinker | 20 |

**3.3: Breeding management**

Breeding is an important tool to generate future stocks. Selection of parents of good genetic merits and their controlled mating may augments the percentage of desired character in the resultant off springs. There is no strategic and planned scheme for dog breeding in Bangladesh. Further, commercial dog breeder is barely found in Bangladesh. Some variables like whether the owner desired to get puppies or not, service with exotic breeds of dogs, last delivery date, normal or induced delivery, post-delivery care and castration of male dog were considered to know what type of breeding and reproduction practice persist in dog owners of Chittagong Metropolitan area. Data analysis demonstrated that fifty percent owner desired to get puppies, ten percents wanted to have no puppies and remaining pet dog owners was failed to give adequate information about getting puppies (Table 3.3). In addition, the owners who cherish to get puppies had tendency to serve their bitch with fifty percent (50%) local breeds and fifty percent (50%) exotic breeds of dog (Table 3.3). However, normal delivery is undertaken in fifty percent (55%) pregnant bitch and induced parturition was adopted in fifteen percent (155) pregnant bitch (Table 3.3). On the other hands, nursing bitch is offered with extra care and management like supplying with easily digestible fish, boiled meat and vegetables in thirty five percent (35%) pregnant bitch and five percent (5%) nursing bitch was deprived of post delivery care. Finally ninety five percent (95%) owner of dog did not want her dog to undergo castration whereas remaining owners wanted to prohibit their dog from unwanted mating through castration (Table 3.3). It should be possible to establish gene bank comprising frozen semen of different population of the same breed and to use this particular bank to overcome the restriction imposed by the breeding stock in particular countries. AI can be used widely to spread the genes of small number of animal widely throughout a breed which will exacerbate of inbreeding problem. The same technique can be used drastically to reduce the level of inbreeding in a population ( Kolosi and Gunn et al., 1997).

Table 3.3: Analyzed Stata on breeding practices of pet dog

|  |  |  |
| --- | --- | --- |
| Variable | Category | Percentage (%) |
| Want to get puppies | Yes | 50 |
|  | No | 10 |
|  | NI | 40 |
| Service with | Local breed | 50 |
|  | Exotic breed | 50 |
| Last pup? | 1-6 months | 20 |
|  | 7-12 months | 15 |
|  | 13-18 months | 5 |
|  | Male | 15 |
|  | Not yet pregnant  | 45 |
| Delivery | Normal | 40 |
|  | Induced | 15 |
|  | Not yet pregnant  | 45 |
| Post delivery care | Yes | 35 |
|  | No | 5 |
|  | Male | 15 |
|  | Not yet pregnant  | 45 |
| Castration | Yes | 5 |
|  | No | 95 |

**3.4: Health care management**

Health refers to a state of physical, mental, social and economical well-beings of an individual. Health sound certificate, vaccination, deworming, last deworming time, nail trimming, skin lesions last six months and death of dog previously were accepted as variables for the analyses. According to the analyses, pet dogs under the study did not have any health sound certificate. It indicates pet dogs were not bought from a certified local breeder company. The breeder company imports pet dog from foreign countries without assessing the thorough health check up of dog. Vaccination should be practiced once in a year if the pet dog had any vaccine previously. Data analysis reveals about ninety percent pet dog had undergone vaccination and ninety five percent pet dog in the study had taken anthemintics (Table 3.4). The findings created a sense that most of the pet owner in Chittagong Metropolitan Area follow vaccination and deworming schedule of pet dog. Nail trimming was carried out by the employed personnel in sixty five percent (65%) pet dog. But owner is not willing enough to trim nail by registered veterinarian. Skin lesions last six months was recorded in twenty three percent (33%) pet dogs whereas fourty-two percents (42%) death of pet dogs occur previously due to disease condition (Table 3.4) .

3.4: Analyzed Stata of health care management

|  |  |  |
| --- | --- | --- |
| Variables | Category | Percentage (%) |
| HSC | Yes | 0 |
|  | No | 100 |
| Vaccination | Yes | 90 |
|  | No | 10 |
| Deworming | Yes | 95 |
|  | No | 5 |
| Last when deworming | 1-3 months | 47.37 |
|  | 4-6 months | 15.79 |
|  | 7-9 months | 21.05 |
|  | 10-12 months | 10.53 |
|  | ≥12 months | 5.26 |
| Nail trimming | Yes | 65 |
|  | No | 35 |
| Skin lesions last 6 months | Yes | 23 |
|  | No | 77 |
| Previous death of dog | Yes | 60 |
|  | No | 40 |

The findings of skin lesions implies that the hygienic management inside and outside of dog shed was overall satisfactory. The combination of an efficient anthelmintics treatment with accompanying hygienic measures was able to suppress Giardia Excretion for sometime in a dog kennel with controlled management. However, even under restricted conditions in a professionally conducted dog kennel, re-infections occurred despite all applied hygienic measures. Whether such measures may be applicable with success by private animal owners remains open ( Fiechter et al., 2011).

**3.5: Hygienic management activities**

Hygienic management is very important in farming system in order to reduce the pathogens inside and outside of the farms. Agents used for bathing, how many times

Dog shed is cleaned, presence of routine schedule to clean dog pen, status of drainage besides the dog pen, hygienic status of feeder and drinker, Cleanliness of outside of dog shed were considered as important variables to assess hygienic practices of dog shed. The study detected around sixty five percent owner brush their

dog in early morning by the employed worker and by themselves. It denotes that most of the owner gave upper hand to the aesthetic matter of their pet dog. Shampoo

and soap containing dirt and sweat removing capacity was used during grooming and bathing in sixty five percent and thirty five percent pet dogs respectively. In addition, fourty percent (40%) owner follow routine schedule to clean dog pen and another fourty percent (45%) owner follow their own procedures to clean dog shed (Table 3.5). Hygienic condition of feeder and drinker, drainage system and outside of dog pen was satisfactory according to data analyses. Waste must be removed daily. Enclosures must be cleaned daily and disinfected once a week. Dogs should be removed during hosing out and kennels should be allowed to dry before they are returned. Disinfection should also occur before new dogs or puppies are introduced and after an outbreak of infectious disease. Manufacturer instructions should be followed with cleaning products. Disinfectants that are active against parvovirus should be used when this disease occurs or is suspected. Enclosures should be dried with the use of a mop or a squeegee after cleaning, if necessary. Disinfectants should be allowed to dry on the treated surfaces (P. A. Martens et al., 1996).

Table 3.5: Data analysis of hygienic management practices

|  |  |  |
| --- | --- | --- |
| Variables  | Categories | Percentage |
| Brush dog | Yes | 35 |
|  | No | 65 |
| Agents for bathing | Shampoo | 65 |
|  | Soap | 30 |
|  | Water | 5 |
| Time of clean dog shed in a month | 2 times | 15 |
|  | 3 times | 15 |
|  | 4 times | 50 |
|  | More | 20 |
| Routine schedule to clean dog shed | Yes | 40 |
|  | No | 40 |
|  | NI | 20 |
| Status of drainage | Good | 75 |
|  | Fair | 25 |
|  | Poor | 0 |
| Hygienic status if feeder and drinker | Good | 55 |
|  | Fair | 30 |
|  | Poor | 15 |
| Cleanliness status outside of farm | Good | 45 |
|  | Fair | 30 |
|  | Poor | 25 |

**Chapter 4: Conclusion**

The owners cherished to get puppies had a trend to serve their bitch with fifty percent local breed. It will reduce the inheritance of good genetic character in the subsequent generation. The change in regular food item is undertaken by fourty five percent (45%) owner which would cause incapability to pet dog to digest and metabolize a variety of nutritious food items rather than specific foods. Pet dogs did not have any health sound certificate. It indicates pet dogs were not bought from a certified local breeder company. The findings created a sense that most of the pet owner in the study area followed vaccination and deworming schedule for their pet dog.

**Limitations**

* The study area does not cover the all Thana in Chittagong Metropolitan area due to shortage of study period.
* Approximately ten questionnaires was accomplished through cross questioning from owners without inspection of dog pen, its feeders and drinkers and hygienic status of dog pen, drainage system and outside of dog shed. So there may rise a probability of unreliable information from the owners.
* The findings of the report did not make a significant correlation with the occurrence of diseases in hospitalized dog and the previous mortality in the dog population.
* In some aspect, the owners did not cooperate with giving necessary information on housing, breeding and health care managements.

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**Annex**

**A questionnaire is operated in Chittagong Metropolitan Area focusing on rearing and management of pet dog**

**Owner information:**

* Name:……………………………………………………………….
* Address:…………………………………………………………………………
* Occupation: ……………………………………………………..
* Mobile No: ………………………………………………………

**Information of pet dog:**

* Spp: …………………….
* Breed : ………………………..
* Patient name(if any ): ……………………………mmS
* Age: ……………….
* Sex : ……………..
* Color : …………………
* Weight : …………………..
* BCS: 1(Cachectic)/2(Fair)/3(poor)/4(Good)/5(Over wt/Fatty)
* Physiological status : Dry/ Estrus/ Pregnant / Recently pup
* No. of pet dog reared : ……………..
* Where it was brought from : ……………………..
* Id No. ………………………………………………………..

**Housing information:**

* Where specifically will the animal keep:
* During the day: ………………………………….
* While you’re home: ………………………….
* At night: ……………………………………………
* When you’re not home: …………………..
* Do you have fenced yard : Yes / No
* Do you have a dog pen : Yes / No
* Does he run loose in an unfenced area : yes / No
* Floor of dog pen: Good/ Fair / Poor
* Status of ventilation : Good/Fair/Poor
* Status of drainage system : Good/ Fair/ Poor
* Status of cleanliness outside of pen: Good/Fair/Poor

**Feeding information:**

* Is your dog on a feeding schedule or self-feed(food left out flat):
* How many times you provide food: ………………..
* Do you ever feed your dog people food from table: Yes / No
* Type of food you provide: ……………………………….
* Do you maintain any change in the regular food item : Yes / No
* Do you face any behavioral problems associated with food: Yes / No
* Do you feed all the dog together or individually: Yes / No
* Where do you keep food: Bowl/Open floor
* Where do you keep water: Pot/Drinker?/Others
* Hygienic condition of feeder and waterer: Good/Fair/Poor

**Grooming and Washing:**

* Do you brush your dog: Yes/No
* Does he growl or snap when grooming: Yes/ No
* How many times you groom and bathe your dog in a week: ……………..
* Mention if any shampoo/soap is used: ……………………………………………..
* How do you bathe your dog: Sprinkler/Pour on/Others
* Period of time you groom and bathe your dog: …………………………………

**Breeding information:**

* Do you want to get puppies: Yes/No
* Mention the service with: Local breed/Exotic
* Parity no: ………………………………………………….
* Mention last when she pups: …………………….
* If you don’t want puppies, you follow: Spaying/Not allow mating with dog
* Delivery: Normal/Induced
* Your male dog undergoes castration: Yes / No
* Do you follow post-delivery care : Yes/ No
* Do you or employed person look after the pet dog: Yes/No

**Health care information :**

* Do you check health of dog by vet in a clinic: Yes/No
* Do your dog have vaccination: Yes/No
* Did your dog have anthelmintics: Yes/No
* Any diseases occur previously: Yes/No
* Do you follow vaccination schedule: Yes/No
* Is nail trimming done: Yes/No
* How many times: ………………………….
* Do you have any health sound certificate for your dog: Yes/No
* Any hypothricosis/skin lesions had seen in last six months: Present/Absent
* Any dog get died due to disease previously: Yes/No
* Before death it was treated: Yes/No

**Hygienic activities information:**

* How many times you clean dog shed in a month: ………………………………..
* Mention the cleaning agents: ……………………………………………………………..
* How many times you clean feeder and waterer: …………………………………
* Where do you discharge stool and food wastages :………………………………
* Any covering you use during winter in the wall of dog house: Yes/ No
* Do you have any daily routine of activities for cleaning of dog house: Yes/No
* Any ectoparasiticidal agents is used outside of dog shed and in the drain: Yes/No
* Condition of outside of dog pen: Bushy/ Muddy/ Dry and clean

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*The Author*

**Biography**

This is Tamim Mahmud, son of Nazir Ahmed and Momtaj Begum. I am the dweller of Ramu, Cox’’s Bazar. I completed S.S.C in 2007 at Ramu Khijaree Model High School, Cox’s Bazar and H.S.C in 2009 at Chittagong College, Chittagong.I got admitted in Doctor of Veterinary Medicine course under Chittagong Veterinary and animal Sciences University in 2009-2010 session. I am enthusiastic to be a researcher on epidemiology and want to be a skilled veterinarian in future.