**INDEX**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Name of the contents** | **Page no.** |
| **I** | **Abstract** | **2-3** |
| **II** | **Introduction** | **4-6** |
| **III** | **Review of literature** | **7-9** |
| **IV** | **Materials & methods** | **9-14** |
| **V** | **Figure** | **15** |
| **VI** | **Result and Discussion** | **16-20** |
| **VII** | **Conclusion and recommendations** | **22** |
| **VIII** | **Problems, solutions and limitations** | **23** |
| **IX** | **Acknowledgement** | **24** |
| **X** | **References** | **25-26** |

**CHAPTER- 1**

**ABSTRACT**

The study was conducted at Upazilla Veterinary Hospital of Chandanish, Chittagong District, duration (5th May to 4th July) -2013 and clinical rotation in SAQTVH 1st duration (21-10-2013 to 27-10-2013) and 2nd duration (01-02-2014 to 14-02-2014). To determine the prevalence of different ectoparasitic diseases in cattle and goat samples were taken from all the animals that come to UVH and SAQTVH for treatment. A total of 165 animals were analyzed of which 22.42% animals were found to suffer from ectoparasitic infestations. The total ectoparasitic cases were higher in male and adult animals compared to young and female animals. The cattle were most susceptible to infection with highest prevalence to myiasis (9.83%) followed by tick infestation (5.73%), lice infestation (3.27%), mange (2.46%), and hump sore (1.64%). In case of goat ectoparasitic diseases was highest in mange (9.3%), followed by myiasis (6.97%) and lice infestation (4.65%). The tick born diseases of cattle from ectoparasitic positive cases were theileriosis (9.71%) babesiosis (3.75%) and anaplasmosis (3.75%). Theileriosis was higher in female and adult animals but babesiosis and anaplasmosis recorded only in adult animals. The variation of ectoparasitic infestation may be variable due to host specificity of the causal agent, age resistance, ecological status, livelihood of the people of the locality and hygienic measure taken by the farmers and the seasonal factors of the years.

**Key word**: UVH, SAQTVH, prevalence, Tick, Mite, Mange.

**CHAPTER- 2**

**INTRODUCTION**

Bangladesh is an agro-based developing country. Bangladesh has a total area of 1,47,570 square kilometer. The total population of the country is 143.7 million and about 80% of the peoples living in the rural areas.

Livestock is an important component of farming system that plays a crucial role in the traditional economy in Bangladesh. The Economic census 2008, livestock has a share of 4.98% in GDP of country.

Some ectoparasitic diseases has zoonotic importance, it is spreads from animals to animals and animals to man by direct contact or via vectors. It also spread from animals to man when contact is made with a contaminated object, equipment, through feeder etc.

The tropical environment of Bangladesh creates a favorable condition for the easy growth of micro-organism and parasites for disease production.

Ectoparasite are important from the point of view of that they causes diseases as a direct agent. They causes entomophobia, accidental injury to sense organ, dermatitis, blood loss, evenomization, myiasis and related infections through allergy. Blood sucking flies, lice, flea take blood from the animal body that causes anemia. These flies also causes annoyance and production losses through their painful bites. In the living animal tissues they lay eggs that creates myiasis. Mite produces mange through embedding skin which causes severe pruritus and hide damage. Tick causes disease like tick toxicosis, tick paralysis by stringing the animals which are even fatal for animal lives. In addition the ectoparasite act as a vector (both mechanical and biological), intermediate host of other parasites. (Whitelock, 1980) Reported that fly like *musca conduces* transmits the parasite *Stephanofilaria assamensis* the causal agent of humpsore. Tick like *Ixodes, Rhiphicephalus* transmits disease like babesiosis, anaplasmosis and theileriosis. These diseases not only cause economic loss but also reduce the production of animals.

The primary concern of a veterinarian is on the disease incidence and disease control. But the paramount importance for the veterinarian is to know specific distribution of ectoparasitic prevalence in different animals, in specific geographic area in relation with season, age, sex of the animals. By knowing all these things a veterinarian can take specific management approaches, easy diagnosis even eradication of ectoparasitic diseases. Therefore the present study was carried out with following objectives-

* To determine the prevalence of ectoparasitic diseases in cattle and goat under Upazilla Veterinary Hospital, Chandanish, Chittagong.
* To know the prevalence of Tick born diseases (Anaplasmosis, Babesiosis, Theioleriosis).
* To study the comparative prevalence of different ectoparasitic diseases (myiasis, Humpsore, mange, Lice infestation, Tick infestation).

Ectoparasitic diseases of cattle and goat:

* Mange
* Lice infestation
* Tick infestation
* Tick toxicosis
* Tick paralysis
* Myiasis
* Humpsore (usually found in cattle)
* Summersore (usually found in cattle)

Skin diseases hamper production of animal by various ways such as mite infestation produce scales, alopesia, itching, erythema and hyperkeratosis, lice produce marked itching, irritation, formation of erythematous macula’s, dermatitis lesions and anemia in case of heavy infestation. Lice and mite also create marked emaciation that leads to weakness and poor health.

**CHAPTER- 3**

**REVIEW OF LITERARATURE**

Literature on ectoparasitic infestation in animals are available elsewhere with emphasis on particular sites. Someone deals with skin diseases of particular species, other deals with particular skin diseases of ruminants are insufficient. The following literatures however reviewed critically found relevant to this present work.

Nooruddin and Dey *(1990)* In 21 districts Of Bangladesh the prevalence of skin diseases in domestic ruminants was 62% of 31,423 cattle, 28.8% of 5773 goats.

Huq and Mollah (1969 ) The prevalence of lice on goats in those districts where found 36.20% in goats respectively. Both young and adults are equally infested; incidence gradually increases from early winter to early spring and falls sharply from May to August.

Urquhart *et al (2000)* single injection of ivermectin is commonly used and has given very good results against ticks and mite infestations in cattle and goat. Alternatively the application off a pour on organophosphate such as phosmet, on @ occasion at an interval of 14 days, is also effective. The amidine, amitraz is effective against sarcoptic mange in cattle and has withdrawal periods of 24 and 48 hours respectively for meat and milk.

Akteruzzaman *et al (2001)* Among the 164 cattle of BAU dairy farm examination the prevalence was stephanofilariasis 19.5%, louse infestation 15.5%, Tick infestation 14%, subcutaneous nodule 14.4%, ear sore 3%, wart 1.2%.

Alim *et al (2001*) the efficiency of ivermectin was tested in goats affected with gastrointestinal parasite, mites, Ticks, ivermectin@ 0.2 mg/kg BW was 100% effective against these ectoparasite of 21st day of treatment.

Rhaman and Akteruzzaman *(2001)* the strength of stephanofilariasis was found to be 5.35 times higher in cross breed cattle, 11.62 and 13.63 times higher in 3-10 years old cattle and cow respectively. The immature cattle where 22.15 and 13.32 times more susceptible to lice and tick infestations respectively . Prevalence of louse infestation was found highest in young cattle and bull.

Rhaman *et al (1972)* reported that incidence of parasitism in the cattle of Mymensingh district is 15.2%.

Roy AK *et al (2000)* reported ted that, *B.bigemina* infection in 6.2%, *T.annulata* in 0.4% *T.motans* in 10.8% and Anaplsma sp in 0.8% cattle in Modupur forest area in Tangail.

Mondal MMH *et al* (1999) conducted a study on blood sucking flies of cattle Mymensingh and they found the prevalence of different flies as *Haematobia exigua* (30.8%), *Stomoyxis calcitrans* (24%), *Tabanus* *striatus* (20.6%), *Haematopota puvialis* (12.4%) *Hippobosca* spp. (4.8) other *Tabanus* spp. (2.9%) other *Stomoxys* spp. (2.8%), *chrysops* disappear (1.5%). The highest prevalence of fly are noticed during monsoon with hot and humid environment. *Haematobia* was abundant just before and after winter. S*tomoxys* mostly occure in monsoon and they attackes outdoor cattle with sunny and humid weather. In mild summer *Tabanus*, *Haematopota* emerges and disappears after autumn. Most of blood sucking flies attack indoor cattle during drizzling or just after rain.

**CHAPTER- 4**

**MATERIALS AND METHODS**

**Duration of study:**

The study was carried out in Upazilla Veterinary Hospital (UVH), Chandanish, Chittagong district during internship placement period that was over 8 weeks of time from 5th May to 4th July 2013 and clinical rotation during 21st October to 27th October 2013.

**Selection of area sample:**

The study was carried out at Upazilla Veterinary Hospital, Chandanish, Chittagong. For the study all the animals (cattle and goat) were recorded form those that came to hospital for treatment. The animals were selected randomly for ectoparasitic infestation.

**Reference Population**:

Domesticated ruminants (Cattle and goats) under Chandanish Upazilla of Chittagong district were considered to be reference population. In study periods 536 animals (cattle=354 and goats=182) were treated in Upazilla Veterinary Hospital due to different diseased condition. Among those patient 165 cases was suffering from ectoparasitic diseases.

**Data collection**:

The necessary information for the diagnosis of skin diseases was collected directly from the owner of the animal through questionnaire. The questionnaire includes following information such as Demographic information (age, sex, body wt., breed, color, and species), socio-economic status of the farmer (Farmers occupation, Rearing experience), and patient data (Duration of illness, history of previous treatment, number of infected animals, body condition), farmers complain and management system (Feeding, Housing, Hygienic measures etc.)

The ectoparasitic diseases were diagnosed by physical examination, laboratory diagnosis and clinical findings of diseases condition.

**Diagnosis:**

* **Physical examination**:

(Karl and Schwartzman, 1964) The animal were examined individually using Dermatological examination techniques of taking history, close inspection, palpation parting of hair coats and itch reflex. The signs, number, location and physical characteristics of the lesion size, shape, texture, color were recorded.

* **Clinical observation of animals**:

All the animals were carefully observed for any sort of ectoparasite or any lesion caused by parasites. Details description, history, esp. The housing status of the animal were recorded in separate questionnaire. Further data were then analyzed to identify the arthropods associated in each infection.

**Diagnosis by fly infestation:**

All the animals were observed carefully. The region flies were abundant were recorded for each animal.

1. **Hump sore:**

The clinical finding:

* Presence of Thick crumbly scab which may crack with the appearance of blood stained moisture in the crack on the hump region.
* Presence of particle hair loss at the affected area.
* Presence of irritation and rubbing.

1. **Myiasis:**

* Diagnosis of myiasis was made on the basis of clinical findings
* Presence of live larvae in the tissue. Sometimes there is secondary bacterial infections.
* Odor & executive secretion from the lesion.

**Diagnosis of mite infestation:**

Among the ectoparasite infested animals suspected mange cases were diagnosed based on the presenting clinical signs and skin scrapping test under microscope.

(Karl and Schwartzman, 1964) The animals were examined individually using dermatological examination techniques of taking history, close inspection, palpation, parting of hair coats and itch reflex. The presenting sign, Number, location and physical characteristics of the lesions viz. size, shape, texture, color were recorded.

**Presenting clinical signs:**

* The animal having rough coat.
* Severe pruritus.
* Alopesia
* Inappetence
* Thickened and corrugated skin
* Grayish lesions, consists of firm most of the nodules on squeezing.
* Lesions observed in the ventral abdomen, neck, tail, poll, inguinal region, eyelid.

**Diagnosis of lice infestation:**

Suspected animals were closely examined for any presence of louse or its nymph or egg. The body coat of the animal was examined by parting of hair and using magnifying glass. This revealed that the positive cases having egg attached to the base of the hair. Few nymph were also detected moving on the skin. With the help of forceps nymphs and eggs were collected. These were taken on the glass slide and the slide placed on the white paper. Then watched closely using magnifying glass and confirmed as lice. Then data was kept on the record sheet. Hossen, M.L. and Mostafa, (1999) Reported that the animal was treated as per recommendations of ivermectin @0.2 mg/kg BW. (vermic®).



**Fig: Lice infestation in goat.**

**Diagnosis of Tick infestation:**

Clinical history:History of the cases were taken from owners and carefully recorded in each case individually, in the record sheet.

Clinical examination: The following clinical examinations were done and the findings were recorded.

Close inspection: close inspections were done carefully to search the tick from the skin. Ticks usually hide under hair and suck blood.

**The common clinical findings are-**

* presence of ticks
* Ticks produce continuous injury.
* Ticks consume considerable amount of blood through sucking and thereby the animal unthrifty and anemic.
* Tick may cause paralysis.
* It creates tick worry to the animal thus causes loss of health occurs.

Among the thick infested cattle which are highly infested were examined for thick born blood protozoal diseases on the basis of various criteria.

**Clinical sign**:

* High fever ( 103°-107°)
* Pale conjunctival mucous membrane due to anemia.
* Coffee color urine due to haemoglobinuria.

**Chapter-6**

**RESULT AND DISCUSSION**

A total of 165 animals were selected for the study. The positive cases were total 69 while the no. of ectoparasitic cases where 37. In male the parasitic disease prevalence is higher than in female. But in young and adult the parasitic disease prevalence is almost equal (42.85% and 41.37%). The ectoparasitic disease prevalence is also higher in male then female. But in animal the prevalence is slightly higher compared to young animal.

Prevalence × 100

e.g. prevalence of total male animal

45.76%

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | No.of cases | Parasite positive cases (parasitic) | | Only ectoparasitic cases | |
| No. | prevalence | No. | Prevalence |
| Male | 59 | 27 | 45.76 | 15 | 25.42 |
| Female | 106 | 42 | 39.62 | 22 | 20.75 |
| Total | 165 | 69 | 41.81 | 37 | 21.23 |

Table1: prevalence of parasitism (male and female)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | No.of cases | Parasite positive cases (parasitic) | | Only ectoparasitic cases | |
| No. | prevalence | No. | Prevalence |
| Young | 49 | 21 | 42.85 | 11 | 22.44 |
| Adult | 116 | 48 | 41.38 | 26 | 24.53 |
| Total | 165 | 69 | 41.81 | 37 | 21.23 |

Table 2: prevalence of parasitism (young and adult)

In cattle prevalence of miyasis is 9.83%.In male and female the prevalence is 12.12% and 8.64% respectively compared to young and adult animals are slightly higher in myiasis infestation (10.11%) to young (9.09%). The prevalence of humpsore in cattle is 1.63% and in male it is 4.87%. In adult animal humpsore is 2.42%.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Traits | No. of  cattle cases | Myiasis | | Humpsore | | Mange | | Lice | | Tick | |
| No. | Preva-  Lence | No. | Preva-  Lence | No. | Preva-  Lence | No. | Preva-  lence | No. | Preva-  lence |
| Male | 41 | 5 | 12.12 | 2 | 4.87 | 2 | 4.87 | 1 | 2.44 | 1 | 2.43 |
| Female | 81 | 7 | 8.64 | 0 | - | 1 | 1.23 | 3 | 3.7 | 6 | 7.4 |
| Total | 122 | 12 | 9.83 | 2 | 1.63 | 3 | 2.45 | 4 | 3.27 | 7 | 5.37 |

Table 3: prevalence of ectoparasitic diseases in cattle (male and female)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Traits | No. of  cattle cases | Myiasis | | Humpsore | | Mange | | Lice | | Tick | |
| No. | Preva-  Lence | No. | Preva-  Lence | No. | Preva-  Lence | No. | Preva-  lence | No. | Preva-  Lence |
| Young | 33 | 3 | 9.09 | 0 | - | 1 | 3.13 | 2 | 6.06 | 2 | 6.o6 |
| Adult | 89 | 9 | 10.1 | 2 | 2.24 | 2 | 2.24 | 2 | 2.24 | 5 | 5.61 |
| Total | 122 | 12 | 9.83 | 2 | 1.63 | 3 | 2.45 | 4 | 3.27 | 7 | 5.37 |

Table 4: prevalence of ectoparasitic diseases in cattle (adult and young)

The prevalence of mange is 2.45%, in male it is 4.87% and in female it is 1.23%. In young animal and animal the prevalence is 3.03% and 2.24% respectively. This result is almost is similar with the work of Nooruddin, M.Rhaman, (1985) where they reported as the prevalence of mange in cattle is 2.47%.

The prevalence of lice infestation in cattle is 3.27%. In male and in young animal lice infestation is higher (3.7% and 2.24%) compared to male & adult animals. This varies with work of Rhaman and Akteruzzaman (2001) were they reported 14.6% lice infestation in BAU dairy farm. The prevalence of tick infestation in cattle is 5.73% in female and young it is higher compared to male adult.

Prevalence of mange in goat is 9.3%. in male and adult goats it is higher compared to female and young animals. This result varies with the work of zamrisaad, M.Hizat, and Kamil, (1990) where as they reported 39.37% of the goats having mange. It may be due to sample size.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Traits | No. of goat cases | Myiasis | | Mange | | Lice | |
| No. | Preva-  lence | No. | Preva-  lence | No. | Preva-  Lence |
| Male | 18 | 1 | 5.55 | 2 | 11.11 | 1 | 5.55 |
| Female | 25 | 2 | 8 | 2 | 8 | 1 | 8 |
| Total | 43 | 3 | 6.97 | 4 | 9.3 | 2 | 4.65 |

Table 5: prevalence of different ectoparasitic diseases in goat (male and female)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Traits | No. of goat cases | Myiasis | | Mange | | Lice | |
| No. | Preva-  lence | No. | Preva-  lence | No. | Preva-  lence |
| Young | 16 | 0 | - | 1 | 6.25 | 2 | 12.3 |
| Adult | 27 | 3 | 11.11 | 3 | 11.11 | 0 | - |
| Total | 43 | 3 | 6.97 | 4 | 9.3 | 2 | 4.65 |

Table 5: prevalence of different ectoparasitic diseases in goat (adult and young)

The prevalence of myiasis in goats is 6.97% in male and female it is 5.55% and 8% respectively and in adult animal it is 11.11% the prevalence of lice infestation is 4.65% in male and female it is 5.55% & 4% respectively. In animals it is 12.5%.

**Table 07: Treatment schedule**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name of diseases condition** | **Generic name of the drug** | **Trade name and Name of the company** | **Dose** | **Roat of administration** | **Duration** |
| Lice infestation (Pediculosis) | Ivermectin1% | Inj. Amectin®  Acme drug | 0.2mg/kg b.wt | S/C | S/D |
| Mite infestation (Mange) | Trichlophen 0.5% or  Ivermectin1% | Pulp. Neguvon  Inj. Ivermec | 0.5% solution  0.2mg/kg | Sprayor  Dipping  S/C | 1st Day, 8th Day & 15th day SD |
| Humpsore (Stephanofilariasis) | Trichlophen 8-20% or  Ivermectin1%  Levamisol Hcl: 600mg. | Oint.Neguvon  Inj. Amectin  Bol. Technomysol | 20%  Solution  0.2mg/kg  7.5mg./kg | Topically S/C  Orally | 2-3 times in a day for10th day SD 5 days |
| Myiasis | Oil of turpentine  OTC-100mg/ml | Inj.Renamycin | 10mg/kg | Dressing | Daily |

Ref. Goergi, jay R. (1974); parasitology for veterinarian; 2nd edition; W.B Saunders company, USA.

SD = Single Dose Inj. = Injection

SC = Subcutaneously OTC =Oxytetracyline

IM = Intramuscularly

**Questionnaire**

UVH, Chandanish, Chittagong and some part of patiya and Sathkania upazilla, Chittagong.

1. Case no. ………………. 2. Date: …………………
2. Owner’s address: …………………………………………
3. Socioeconomic status of farmer: …………………………
4. Occupation: service /business /farmer / others.
5. Rearing experience: 1yr / 2yr / 3yr /more than 3yr’s
6. Demographic information:-
7. Age: ……………………… e. sex: ……………………
8. Body weight: ………………f. Breed: …………………
9. Color: ………………………g. Species: ………………
10. Patient data:-
11. Duration of illness: ……………………………………..
12. History of previous treatment: …………………………
13. No. of infected animal: …………………………………
14. Body condition score: …………………………………..
15. Farmer’s occupation: ………………………………….
16. The animal having rough hair and alopesia
17. Inappetence
18. Loss of production
19. Management system:

i. Feeding ii. Housing iii. Hygienic measure

10. Cl. Sign: …………………………………………………..

11. Tantative diagnosis: ………………………………………

12. Medication/ Treatment: …………………………………

Signature

**Chapter-7**

**CONCLUSION AND RECOMMENDATION**

Ectoparasitic infection is one of the most important health hazard in cattle and goat. The economic cause lost by these is remarkably higher. Many of these diseases also have zoonotic importance. The present study showed the significant level of ectoparasitic infestation. In sub-urban areas and further study at rural level could be more informative to understand the actual extent of infection throughout the country. The environment condition and topography of Bangladesh is favorable for these arthropod to produce disease. Poor management, unavailability of drugs, lack of awareness of farmers is also responsible for higher prevalence of ectoparasitic diseases. Sufficient preventive measure should be undertaken while positive cases should be treated with appropriate drugs. Routine flock treatment, bush destruction, cleaning and sanitations of premises and overall hygienic management can reduce the prevalence of ectoparasitic diseases.

**Chapter-8**

**PROBLEMS, SOLUTION, LIMITATIONS:**

Due to the short duration of the study period the relationship of different types of skin diseases with the season cannot be studied. We know that season plays a great role in the epidemiology of some disease for which prevalence of different diseases is varies with the season.

Small number of sample size. If the sample size of the cattle, goat population in which I conducted my study will large, then the result may become more accurate than this result.

Lack of laboratory diagnosed mainly by taking clinical finding. If laboratory diagnostic facility was available then the accuracy of the result will be more significant.

Due to lack of microscope, stains and other instruments laboratory examination of blood and skin where not possible. So tick and mite infestation was done by clinical examination.

Some others limitations are-

* The study was conducted for 2 month. This period was very short to conduct a study fruitfully.
* Many times staffs were non cooperative.
* Sometimes misleading information was drawn by farmers.
* Collected sample e.g. skin scrapping were spoiled due to delaying in transport to laboratory. .

**Chapter-09**

**ACKNOWLEDGEMENT**

All praises are due to “Almighty Creator” who enabled me to complete this work successfully. The author feels great pleasure to express his deepest sense of gratitude, sincere appreciation and profound regards to his reverend teacher and internship supervisor Dr. Mohammod Alamgir Hossain, Professor, Dept. Of Pathology and Parasitology, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong. For his valuable advice, suggestion and kind cooperation during the study period.

The author also would like to express his deepest sense of respect and appreciation to DR. Md. Riazzekul Hossain (Jasim), ULO, Chandanish Veterinary Hospital, Chandanish, Chittagong for his cooperation during my study period.

The author extends his appreciation to animal owners for their patience in giving information.

The author would like to thanks to all his friends and well wisher for their help, encouragement and inspiration during the study period and preparing the report.

The author

**Chapter-10**

**REFERENCES**

**Akteruzzaman *et al* (2001)** Thefarm examination prevalence of cattle of ectoparasite in BAU.

**Alim *et al* (2001)** the efficiency of ivermectin tested on goat against gastrointestinal and ectoparasite.

**Economic census (2008)** Livestock share in national GDP in Bangladesh.

**Georgi jay R (1974);** *parasitology of veterinarian,* 2nd edition; W.B. saunders company,USA.

**Haq and Mollah (1983)** *Incidence of sheep nasal bot in black Bengal goats; Bangladesh vet*.*J* 17;11-18.

**Hossen ML and Mostafa (1999**) efficacy of ivermectin, tobacco leaf extract copper sulphate formulation in Tick & lice infestation in cattle*; The Bangladesh veterinary journal*5, 21-24.

**Krel and Schwartzman (1964);** *veterinary & comparative dermatology,* 1st edition, J.P.lipincott Co.,philadlphia.

**Mondal MMH *et al (*1999)** prevalence of temporal distribution off blood sucking flies of cattle in Mymensingh, Bangladesh, *the Bangladesh veterinarian* 16(2); 53-55.

**M Hizrat and Kamil (1990)** prevalence of temporal distribution of blood sucking flies of cattle in Bangladesh, The Bangladesh veterinarian 16(2); 53-55.

**Nooruddin and Day AS (1990)** Further study on the prevalence of skin diseases in domestic ruminants of Bangladesh, *The Bangladesh veterinarian* 7, 75-81.

**Nooruddin,M. and Rhaman,MS (1985);** a note on bovine demodicosis in Bangladesh, *Indian j. vet.med.* 5; 139-140.

**Roy AK et al (2000)** ecology of tick born blood protozoa in madaripur forest area; Tangail, The Bangladesh veterinarian; 17(2); 90-94.

**Rhaman et al (1972**) Incidence of disease cattle in mymensingh, Bangladesh veterinary journal 6; 25-30.

**Rahman and Akteruzzaman (2001)** association of skin diseases with demographic variables in cattle, the Bangladesh veterinarian 18(1); 78-81.

**Urquhart *et al* (2000)** *veterinary pathology,* 2nd edition; Blackwell science, oxpord, UK.