# CHAPTER I

# INTRODUCTION

Myiasis (*myia* is Greek word for "fly" Shinohara et al*., 2004)*. Myiasis can be defined as the infestation of live vertebrates (humans and/or animals) with dipterous larvae. In mammals dipterous larvae can feed on the host's living or dead tissue, liquid body substance, or ingested food and cause a broad range of infestations depending on the body location and the relationship of the larva. It is also can be defined as the infestation of vertebrate animals with dipterous fly larvae, feed on the host's dead or living tissue, liquid substances, or ingested food for a period of time (Serra– Freire and Mello, 2006). Causative fly may be classified as obligatory or specific, facultative or semi–specific and accidental (Catts and Mullen, 2002; Jelinek et al., 2000). Flies that caused myiasis belong to the families Calliphoridae, Sarcophagidae, Hypodermatidae, Oestridae and Gasterophilidae etc. However, some other species belonging to the families such as Muscidae, Psychodidae etc. may cause myiasis rarely (Serra–Freire and Mello, 2006).

Wounds, soreness and laceration, breach after delivery, urine and fecal contamination, cleanliness and sanitary condition, wetted fleece or hair, lack of aseptic surgery, bacterial skin contamination with foul odor etc. are still conventional as the major predisposing factors for myiasis (Myiasis Wiki vet, 2011).
Infestations of its cause irritation (biting and rubbing the affected sites), annoyance to animals; disruption of normal habits including resting, feeding and digestion which has leading role to retard growth, loss of weight and reduced milk and meat production etc. (Otranto et al., 2004).

For the prevention from vulvar myiasis need extra care going to tropical areas and spending a lot of time outside. Cover your skin to limit the area open to bites from flies, mosquitoes, and ticks. Use insect repellant, properly washing of wet area and should tried to keep the skin dry. In areas where myiasis is known to occur, mosquito nets should be used.

In Bangladesh, Rahman et al. (2009) conducted a study on clinical evaluation of different treatment regimens for management of myiasis in cattle. However, so far, very limited research was initiated with a view to consider prevalence and feasible associated risk factors of myiasis in Bangladesh. Therefore, the present work was anticipated to explore the prevalence and risk factors of vulvar myiasis in goat in different Chittagong, Bangladesh to revise the episode of vulvar myiasis with respect to age, sex, breed, season and predilection site etc to look over the depthness of myiatic wounds.

**Objectives:**

**1.** To determine the overall scenery of vulvar myiasis in the study area.

**2.** To calculate the prevalence of risk factors of vulvar myiasis.

# CHAPTER II
# MATERIALS AND METHODS

## 2.1 Study area

The study was undertaken at raojan (30days) and Rangunia (35days) Upazilla of Chittagong district and at Shahedul Alam Quadary Teaching Veterinary Hospital (SAQTVH) of Chittagong Veterinary and Animal Sciences University to determine the prevalence and risk factors of vulvar myiasis.

## 2.2 Study period

The study was performed from $1^{st}$ July 2016 to 1st June 2017.

## 2.3 Experimental design

Study was conducted at SAQTVH of CVASU based on data recording of vulvar myiasis from case sheet of previous 1 year by drawing attention of authority through application. Then the study was conducted at Raojan Upazilla hospital for 30 days and at Rangunia Upazilla hospital for 35 days in Chittagong, Bangladesh. In Upazilla hospital case of vulvar myiasis was recorded from animal registered book with the helped of compounder. The case was recorded on vulvar myiasis of Local breeds (black bagel, Jamunapari, cross of local with Jamunapari from raojan and Rangunia Upazilla of Chittagong area. About 4500 diseased animal of different species and age were examined at SAQTVH) and Upazilla Veterinary Hospital of Raojan, Rangunia. Necessary information and data related to the diagnosis of this disease was taken from the recorded case sheet and workers of the Hospital. For data analysis collected data was categorized in different parameters such as data collected area, breed, age of animal, parity of animal, and body condition score of animal. Then attempt was taken to check the effect of seasonal variation, depthness of wound, temperature of body, general attitude of affected animals.

## 2.4 Case identification and examination

The case identified depending on case sheet and registered book. According to the case sheet case identifying procedure was owner's complaint, history of weakness, onset and duration of illness, bleeding from septic wound area (Fig-2), swollen of vulva (Fig-1,3), following of treatment, identification of feasible risk factors and clinical examination of vulvar myiasis affected goat. General attitude (alertness/dullness/depression) and body condition of animal (Cachectic/ poor/ fair/ good/ fat/ over fat) were carefully inspected by distant inspection as Radostits et al., 2000). In addition, posture and gait (normal/ defective) were examined. Animal was closely examined by parting of hair/fleece; light palpation and close direct inspection to detect hair coat, skin abnormalities, skin lesions (foul odorous discharge, crusts, scale and dandruff), and distribution of maggots were recognized. Myiatic wound(s)  identified by inspection and categorized wound whether it might be septic/ lacerated/ incised/ punctured/ perforating/ abrasions/avulsion/hematoma. Maggots of    flies explored through inspection and removed from wound(s) by using tissue forceps or artery forceps (Fig-4). In addition, depthness (deep or superficial) of wound was determined using metal probe or forceps.

Fig-1: Myiatic wound in Vulva region



Fig-2: Bleeding from the wound



Fig-3: Myatic wound in vulva



Fig-4: Maggot larva

# CHAPTER III

## DATA COLLECTION AND ANALYSIS

### 3.1 Questionnaire design and data collection

A closed ended (categorical) questionnaire was designed for recording the information regarding vulvar myiasis in Rangunia and Raojan Upazilla, Chittagong. At SAQTVH case was recorded from the patient registered card from July 2016 to June 2017. Among the total 51 cases 40 cases from SAQTVH and 5cases from Raojan, 6 cases from Rangunia. In case of Upazilla hospital repeated questioning was performed over rearing system of affected animals, species, breed, age, sex, body condition, weakness, onset and duration of illness and associated risk factors from July 2016 to June 2017, where seasons: summer (Mar 2017 to May 2017), rainy (July 2016 to August 2016 & June 2017), autumn (Sept 2016 to Nov 2016) and winter (Dec 2016 to Feb 2017) and were recorded. Other necessary information sought including deworming, vaccination, pregnancy status, parity, housing pattern, floor (Katcha/ dirty/ muddy/ brick/ concrete/ rubber bedded), rearing system (intensive or semi–intensive or free range) as well as system of grazing or zero grazing were also recorded.

### 3.2 Statistical data analysis

The collected data entered into MS excel (Microsoft office excel–2010, USA). Descriptive analysis was through by STATA version–12.1 (STATA Corporation, Texus, USA) to estimate the association between a categorical explanatory variable with outcome and then Chi square ($\chi^2$) test was performed to estimate the percentage of determine parameter. An association for data for analyzing was regarded as significant if $p \leq 0.05$.

# CHAPTER IV

# RRSULT AND DISCUSSION

**Table 1: Association between different variables causing vulvar myiasis in goats tested using Chi square (χ2) test:**

| Variable | Level | Total positive case N(%) | P value |
|---|---|---|---|
| **Breed** | Black Bengal<br>Cross<br>Jamunapari<br>Local | 3(6.5%)<br>21(41.12%)<br>11(21.7%)<br>16(28.23%) | **.003** |
| **Area** | SAQTVH<br>Rangunia<br>Raojan | 40(78.73%)<br>6(11.76%)<br>5(9.81%) | **.003** |
| **Age** | ≥24 months<br>≤24 month | 29(55.67%)<br>22(44.2%) | .005 |
| **Parity** | ≥ 2 times<br>≤2 times | 33(64.5%)<br>18(35.5%) | .005 |
| **BCS** | 1.Cachectic<br>2.Poor<br>3.Fair<br>4.Good | 3(6.88%)<br>14(27.1%)<br>23(45.8%)<br>11(20.9%) | .49 |
| **Season** | Autumn<br>Rainy<br>Summer<br>Winter | 24(47.78%)<br>11(21.55%)<br>9(17.35%)<br>7(12.6%) | **.55** |
| **Depthness of** | Deep | 36(70.3%) | **≤.001** |

| wound | Superficial | 15(29.3) | |
|---|---|---|---|
| **Temperature of body** | Fever | 32(62.85%) | |
| | Normal | 17(34.2%) | .005 |
| | Sub normal | 2(2.8%) | |
| **General attitude** | Alert | 19(37.4%) | |
| | Depressed | 12(24.5%) | .004 |
| | Dull | 20(38.1%) | |

During my study period total 51 vulvar myiasis cases were evaluated from approximately 4500 different cases where the highest number of cases in SAQTVH (40 cases) and lowest numbers at Raojan (5 cases). Collected data was categorized to breed wise where cross breed 21(41.12%) were more prone to vulvar myiasis than others where black bangle 3(6.5%) was more resistance to vulvar myiasis. In age groups were categorized accordingly above 24 months old and found positive case 29 (55.67%), less than 24months old 22 (44.2%) case was recorded. Parity significantly influenced to casue vulvar myiasis in goat. Above 2 times 33(64.5%) were highly affected than less 2 times 18 (35.5%) 0f parity. Accordingly BCS Fair body condition 23 (45.8%) showed more prevalence to occur vulvar myiasis than cachectic body condition 3 (6.88%). In seasonal influence autumn 24 (47.78%) is more than others season to show more prevalence rate. In case of depthness of wound deep wound 36(70.3%) was more inflicting factors than superficial 15(29.7%).In case of body temperature most of goats showed high temperature32 (62.58%), where only 2 goats showed sub normal temperature , general attitude were dull20(38.1% ) and depressed (12%),with significantly associated($p \leq 0.05$) with causing vulvar myiasis (Table-1)

**Table no -2: Effects of risk factors on the prevalence of vulvar myiasis in goat**

| Serial no | Risk factors | Prevalence of vulvar myiasis |
|---|---|---|
| 1 | Bleeding, wound, swelling, vesicle, abscess and pus with foul odor | 23(45%) |
| 2 | Bed sour, foldness, friction | 11(20%) |
| 3 | Post-partum period | 12(23%) |
| 4 | Insanitary , infrastructure  of housing | 22(42%) |
| 5 | Plan land housing | 6(11%) |
| 6 | Wart in vulva region | 1(1.7%) |

# DISCUSSION

Wounds with bleeding foul odor, swelling, vesicle and abscess by bacterial contamination were the most crucial risk factors (45%) for vulvar myiasis after parturition (23%). However, breach after delivery in goat, insanitary and germ– infested infrastructure of housing (42%) leads to bed sore (20%) were the most significant risk factors. Additionally, plan landing house (11%), wart in vulva region (1.7%) (Table- 2). Besides, dirtiness and wetted surroundings (fleece, hair) with fecal and urine contamination, lack of aseptic measure during parturition with unsterile instruments (scissors, scalpel, forceps, hand gloves etc.), accidental injury in vulva region were the major risk factors that was evaluated that would be the inflecting factors to cause vulvar myiasis in goat.

In this study 1.12% Vulvar myiasis case was recorded in goat in Chittagong district. Which is not comparable to other's result due to scanty articles? However, it can slightly compare with the findings of Imtiaz et al (2014) who reported myisis case were in goat 69%, cattle 22%, dog 15.3%, humans 14.7%, pigs 6%, horse 4% and sheep 1%.

Present study showed more vulvar myiasis case was in autumn (47.78%) and Rainy season (21.55%) (Table -1).which is not agreed by any articles due to scanty publications. This findings result rarely agrees to Radfar and Hajmohammadi (2012) in where they made report on all body parts myiasis case and reported that prevalence varied from 6.8% to 41.8% in August, 2007 to February, 2008 in south eastern part of Iran. Paredes-Esquivel et al (2012) recorded significant difference in prevalence in winter and autumn fly activity held between May to June in the island of Majorca (Spain). In addition, Shoorijeh et al. (2011) found prevalence ranged from 6.6% in spring to 17.9% in winter in South Iran where Abd El–Rahman (2010) analyzed infestation rate in camel was significantly greater in colder (68.8%) than warmer (31%) in Western Libya., Orfanou et al. (2011) found six cases from May to July and three cases from August to October in 163 dogs. Alem et al. (2010) described prevalence ranged from 77.7% to 98.8% from November to March in sheep and goats in Central Oromia which is more than this

prevalence. There also Arslan et al. (2009) reported prevalence of nasal myiasis was 54.3% in spring, 41% in summer, 28% in rainfall. rainfall, 38.9% in winter and statistically significant differences among seasons ($p \leq 0.05$) at north–eastern part of Turkey; Alahmed (2004) stated highest percentages of myiasis during Mar–May (60%) and Sept–Nov (31.5%) where temperature and relative humidity are optimum and infestation incidences were low (5% and 1.5% respectively) at dry hot season (Jun–August) and cold season (Dec–Feb) in Riyadh Region; Dorchies et al. (2000) found prevalence from 14.3% to 65% in Feb–Oct in sheep and 6.25% to 47.1% in Sept–Apr in goat in France; Farkas and Hall (1998) described myiasis season lasted from March to November where most cases were available in July and August at sheep, cattle and horses in Hungary; Amin et al. (1997) revealed high infestation rate in summer, followed by spring then autumn. However, Cramer et al. (2002) said no month of the year presented higher occurrence of myiasis cases

Overall prevalence of vulvar myiasis was 1.12% among 4500 cases which is slightly agreed by Giangaspero et al. (2011), Al ahmed (2004) who reported 3% out of 3129 in Italy, 2% out of 3712 in Riyadh Region respectively. Though they reported on total myisis that found in all over the body. However, Radfar and Hajmohammadi (2012), Shoorijeh et al. (2011), Gebremedhin EZ (2011), Arslan et al(2009), Kara et al. (2005), Abo– Shehada et al. (2003) and Dorchies et al. (2000) found higher prevalence rate of myiasis.


In this study total 51 cases were recorded of vulvar myiasis where cross breed 41.12%, local breeds 28.23%, Jamunapari 21.1% and Black Bengal 5.65% which is not comparable to others due to less publications. Which is slightly compare to Sergio et al. (2007) where they made result on myiasis case according to species. They showed that stating cattle and goat 46.4% followed by dogs 15.3%, humans 14.7%, pigs 6%, horses 4% and sheep 1%. Apparent deviation is reflected the differences in the level of management, housing, cleanliness as well as genetic variation in disease resistance

breeds. It was agreed by the Kara et al (2005) found adult and short haired pure male dog breeds were mostly infested.

Through the study it was found that Poor to fatty goat were more infested with vulvar myiasis, which is agreement with Gebremedhin (2011).

Above 2 years old goats were more prone to vulvar myiasis (55.67%) ($p \leq 0.05$) which is close to Rahman et al. (2009) where myiasis mostly occurs in cattle of over 2 years. However, different agreement by Kara et al. (2005) implicit infestation which is decreased with the age of cattle and Abo–Shehada et al. (2003) stating all age groups were equally infested. Paredes– Esquivel et al. (2012) found prevalence in lambs younger than 4 months was significantly affected ($p \leq 0.05$) which was insignificant in adult sheep.

Bleeding from septic wounds, swelling, vesicle, abscess and pus with foul odor have been identified mostly as major predisposing factors (Fig-2). Particularly deep wound significantly harboring huge maggots compared to superficial wounds ($p \leq 0.05$) which is an agreement with Farkas and Hall (1998). They reported that dirtiness with fecal and urine contamination, poor housing infrastructure, floor with rough surface (brick, concrete) leads to bed sore and septic wound that may cause myiasis. Which is also has agreement with Bhola et al. (2012). Phillips (2009) confirmed sheep were predisposed to fly strike (cutaneous myiasis) where fleece was contaminated with feces or urine.

Accidental injury and traumatic wound at the vulva region (nail, barbed wire, glass etc.) is another important risk factor causing vulvar myiasis. Slightly agreed by Trombetta et al. (2009) reported traumatic myiasis habitually in cattle, dogs and cats whereas Farkas and Hall (1998) found traumatic myiasis infestation >10% of animals at sheep, cattle and horses in Hungary. Additionally, Dik et al. (2012) found 22 traumatic myiasis in animals in Turkey; Ipek DN and Ipek P (2012) observed a facultative traumatic myiasis in domestic rabbit; Giangaspero et al. (2011) examined 10 traumatic myiasis in Italy. Scholtz et al. (2011) reported as presence or absence of dermatophilosis was the main

predisposing factor for blowfly strike in sheep. Amazingly gangrene, wart, polyp are fascinating risk factors of myiasis.

# CHAPTER V

# CONCLUSIONS

Present study reflects the total scenery of vulvar myiasis correlation between different variable and possible risk factors that influence causing vulvar myiasis in goat. Vulvar myiasis is a great concerning issue in livestock production due to induce infertily in the flock. Through this study it was found that about 1.12% goats were affected by vulvar myiasis which is alarming for agro based economic country like us. It is found that autumn and rainy season were more influcing factor to prone vulvar myiasis with bleeding from septic wound, swelling, insanitary infrastructure of housing in plan land were major risk factors causing vulvar myiasis after parturition. Therefore, it is the time to build up awareness among the masses about the actual cause and risk factors of occurring vulvar myiasis in goat. The preventive measure like maintenance of neat and clean surroundings, control of fly population and use of window nets would be helpful for protecting the goat from myiatic infestation.

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# APPENDIX
# QUESTIONNAIRE

Date ……………….                              Case No………

A. Basic Information
   1. Name of the farm……………………………………………
   2. Name of the farm owner…………………………………….
   3. Cell number of the owner………………………………….
   4. Address of the farm……………………………………….

   5. Type of farm………………………………………………

   6. Farm size and composition…………………………………

   7. Age of goat………………………………………………..

B. Housing pattern and Management
   1. Housing system: Intensive/ Semi-intensive
   2. Floor system Litter /Concrete/ Slat/ Cage
   3. Ventilation: Poor/ Moderate/ Good
   4. Frequency of cleaning house: Daily/Every alternate day/Once in a week.

C. Feeding Management
   1. Feeding system :Scavenging/ Supplement/ Both
   2. If supplement: Homemade/ Commercial  Balanced Feed

D. Disease outbreak information
   1. Symptoms of disease……………………………….
   2. On set of duration…………………………………
   3. Any Treatment……………………………………

E. Diagnosis…………………………………………….

Case sheet with treatment



Case sheet with treatment

# ACKNOWLEDGEMENT

# Biography

I am Md. Sahabuddin come from a renowned Muslim family belongs to Rangunia Upazilla. We are 5 in numbers consist of two brothers, one sister and father and mother. I completed my primary education from Raikhali Refusi Para Govt. primary school situated at Rangamati district. I Passed Secondary School Certificate (SSC) examination from Narangiri Govt. high school located at Kaptai Upazilla in Rangamati district 2009 then Higher School Certificate (HSC) examination from CUET School and College, Chittagong in 2011.Then I enrolled myself at Chittagong Veterinary and Animal Sciences University for taking Degree of Veterinary Medicine. Now I am performing my internship program under the degree of Veterinary Medicine for duration of 1 year. I dream an earth where all the creates will remain together like a family of unit. My vision is to ensure a happy life both for human and animal through giving natural touch. I have interest in physiology especially in endocrinology that is involved in reproduction to improve the production rate in farm and rural level. This improvement of production rate may play a vital role in our GDP increment. I hope I will able to fulfill my desire to give service to the rural as well as farm level through gathering knowledge of Veterinary Medicine and it will be longer. I like traveling, listing of songs, Reading of science fiction book, Playing. I feel proud to be a part of CVASU family.