**Chapter-4**

**Result and Discussion**

**4.1 Prevalence of gastrointestinal parasitic infection:**

**4.1.1Descriptive statistics of different variables:**

Samples were collected from different breeds of cattle, namely Red Chittagong Cattle (RCC), local breed and crossbred of HF which constituted 22%, 44% and 34% samples, respectively. Among all study population 56% were female and the rest 44% were male. Samples were collected from three group of animals on the basis of body condition (cachectic, medium and healthy) of which 16% sample were from cachectic animal, 22% were from healthy animal and 62% were from medium health animal. The study population were categorized into three sub groups as calf (≤ 1year i.e. 12 month), young (>1 -<2.5years i.e. >12-<30 month) and adult (≥2.5years i.e. 30 month) which consist 40%, 34% and 26% of total samples. Among the study population, 50% animal were dewormed and 50% were not dewormed.

**Figure 3:** Descriptive statistics of the variables: breed, sex, deworming, BCS, age.

**4.1.2 Overall prevalence of gastrointestinal parasites in cattle:**

During the current investigation, an approach was taken to determine the status of gastrointestinal parasitic infection in cattle. It was revealed 7 helminthes species as 1 Cestodes, 2 Trematodes and 3 species of Nematodes in cattle population. The overall prevalence of gastrointestinal parasitic infections (either single or mixed infections) was 64% in study population.

**Table 1**: Association of different variables with overall parasite positive samples

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | Level | Total observation | Samples positive to parasites (%) | Chi square value | p-value |
| Breed | Cross | 17 | 12 (71) | 0.74 | 0.65 |
| Local | 22 | 14 (64) |
| RCC | 11 | 6 (55) |
| Sex | Female | 28 | 17 (61) | 0.29 | 0.60 |
| Male | 22 | 15 (68) |
| BCS | Cachectic | 8 | 8 (100) | 11.12 | 0.004 |
| Healthy | 11 | 3 (27) |
| Medium | 31 | 21 (68) |
| Deworming | Yes | 25 | 12 (48) | 5.55 | 0.01 |
| No | 25 | 20 (80) |

The above table showing association of different variables with overall parasite positive samples. Chi square test was performed to identify the association of different variables with the presesnce of parasitic infestation.The study population consists of 3 cattle breeds;crossbreed of Holstein Friesian(HF), local breeds and Red Chittagong Cattle(RCC). Among these 3 breeds prevalence of gastrointestinal parasitic infection is highest in crossbred cattle (71%) and lowest in RCC cattle (55%) however,variables were not significantly associated(P-value=0.65).

In the study population no of female is 28 and male is 22. The prevalence of gastrointestinal parasitic infection is slightly higher in male (68%) than female (61%) but this is not statistically significant(P-value=0.60)

The study population was categorized into 3 group according to BCS, these are cachectic, healthy and medium. The prevalence of parasitic infection is highest in cachectic animal (100%)and lowest in healthy animal (27%) and the variable is statistically significant(P –value=0.004).

 The prevalence of parasitic infection is higher in dewormed animal (80%) than not dewormed animal (48%) and this variable is also statistically significant (P –value=0.01).

**4.1.3 Prevalence of different genus of gastrointestinal parasitic infestation in cattle:**

**Figure 4**: Histogram showing the frequency and percentage of samples positive to different parasites, overall parasite positive and samples negative to any parasites.

The current study revealed that, prevalance of gastrointestinal parasitic infestation is 64% in study population. In case of single parasitic infection,among the different genus of parasites prevalence of Paramphistomum is highest (22%) and lowest prevalence for Trichostrongylus (2%). The prevalence of mixed parasitic infection such as Paramphistomum, Oesophagostomum and Paramphistomum,oocyst are almost same.

Among the parasitic infestation prevalence of Paramphistomum spp is highest. Association of different variables with Paramphistomum positive samples is shown in a table below:

**Table 2:** association of different variables with Paramphistomum positive samples.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | Level | Total observation | Samples positive to parasites (%) | Chi square value | p-value |
| Breed | Cross | 17 | 2 (12) | 4.04 | 0.13 |
| Local | 22 | 9 (41) |
| RCC | 11 | 3 (27) |
| Sex | Female | 28 | 10 (36) | 1.87 | 0.17 |
| Male | 22 | 4 (18) |
| BCS | Cachectic | 8 | 1 (13) | 2.34 | 0.31 |
| Healthy | 11 | 2 (18) |
| Medium | 31 | 11 (35) |
| Deworming | Yes | 25 | 6 (24) | 0.39 | 0.52 |
| No | 25 | 8 (32) |

We conducted a Chi square tests to asseses the association of different variables with the presence of Paramphistomum infection. The analysis revealed that there is no statistically significant varying prevalence of Paramphistomum infection according to different breeds. Very low prevalence of Paramphistomum infection is in cross bred and very high prevalence is in local cattle. The prevalence of Paramphistomum infection is slightly higher in female (36%) than male(18%) but this is not statistically significant(P-value=0.17). The study population was categorized into 3 group according to BCS, these are cachectic, healthy and medium. The prevalence of Paramphistomum infection is highest in medium animal (35%) and lowest in cachectic animal (13%) though the variable is not statistically significant(P –value=0.31). The prevalence of Paramphistomum infection is higher in not dewormed animal (32%) than dewormed animal (24%) and this variable is not also statistically significant (P –value=0.52).

**4.1.4 Age specific prevalence of gastrointestinal parasitic infestation:**



**Figure 5**: Distribution of age among the study population

Occurrences of gastrointestinal parasitic infestation were influenced by the age of animals. During this investigation, cattle were categorized into three sub groups as calf (≤ 1year i.e. 12 month), young (>1 -<2.5years i.e. >12-<30 month) and adult (≥2.5years i.e. 30 month). It was observed that, the highest prevalence of parasitic infection in young cattle and lowest in calf and adult. The highest prevalence is found in the age 12 months and lowest is found in below 10 month of age (Figure 1).

**Table 3:** Age-specific prevalence of different genus of gastrointestinal parasites.

|  |  |  |  |
| --- | --- | --- | --- |
| Name of the parasites | Calf (≤ 1year i.e. 12 month)N=20Total positive (%) | Young (>1 -<2.5years i.e. >12-<30 month)N=17 | Adult(≥2.5years i.e. 30 month)N=13 |
| *Paramphistomum* spp | 6(30%) | 5(29.41%) | 4(30%) |
| *Fasciola spp* | 1(5%) | 3(17.64%) | 1(7.69%) |
| *Oesophagostomum* spp | 1(5%) | 1(5.88%) | 2(15.38%) |
| *Trichostrongylus* spp | 0(0%) | 1(5.88%) | 0(0%) |
| *Toxocara* spp | 6(30%) | 0(0%) | 0(0%) |
| *Moniezia* spp | 1(5%) | 1(5.88%) | 1(7.69%) |
| Oocyst  | 2(10%) | 0(0%) | 0(0%) |

The above table, showing age specific prevalence of different genus of parasites. In calf, Paramphistomum spp and Toxocara spp infection is higher (30%) than other species of parasites. In young and adult animal, paramphistomum infection is highest 29.41% and 30% respectively.

**4.1.5 Sex specific prevalence of gastrointestinal parasitic infestation:**

In the current study, it was exposed that female cattle showed almost same susceptibility to different gastrointestinal parasites like male but it was not statistically significant. However, prevalence of *Paramphistomum* spp infections was the highest in female cattle (35%) than male. Prevalence of *Fasciola* spp infections (18.18%) along with *Toxocara* spp (18.18%) were found more in male cattle. *Trichostrongylus* spp and *Moniezia* spp infection were only recorded in female cattle of this study.

 **Fig7:** Sex-specific prevalence of gastrointestinal parasitic infestation in cattle.

**Discussion**

**5.1 Overall prevalence of gastrointestinal parasitic infections:**

The overall prevalence of gastrointestinal parasitic infections in cattle of this study showed somewhat similiarity with the report of (M.A. et al.2001) who recorded 63.32% had single parasitic infection in Bangladesh. The observation greatly varied from the report of (Alim et al.,2011) who recorded 39.75% and 46.25% in crossbred and local cattle, respectively. The report is also varied from (Khan et al 2010), (Saravana et al2009)and (Rahman and Razzak 1973)who recorded 33.68% in Pakistan ,30.0% in India and 37% in comilla district in Bangaldesh. Variation in the occurrence of gastrointestinal parasites infection might be due to geo-climatic conditions, sample size, breed, age, sex, plane of nutrition, stress, availabiltiy of intermediate host, vegetation, grazing pattern, rearing and husbandry measures, anthelmintic therapy, genetic resistence etc (Hansen and Perry, 1993).

Prevalence of *Fasciola spp* infection of this study was lower than the observation of (Iqbal et al., 2007), Rahman and Razzak 1973 and Garrles 1975) who recorded 21.42% in Pakistan and 16.30%, 22.0% respectively in different places of Bangladesh. The observed result also higher from the findings of (Alim et al.,2011) who recorded 2.54% and 0.92% **in indigenous and crossbred cattle in different regions of Chittagong regions. Higher prevalence of *Fasciola spp* might be due to geo-climatic condition ( Kakar et al.,2008) or poor sample size(Bachal,2002).**

**Prevalence of *Paramphistomum spp* infection of this study was higher(22%) than the observation of (Kakar et al 2008) who recorded 7.82% in Pakistan and (Alim et al .,2011) recorded 14.81% and 12.96% of Paramphistomiasis in Holstein Friesian crossbred and indigenous cattle, respectively. Higher prevalence of Paramphistomiasis (25%) was recorded by (Sardar et al., 2006, Raza et al., 2009) ,Hirani et al.2006) in different countries of the world which is similar to this study. Higher prevalence of *Paramphistomum spp* infection of this study might be due to geo-climatic conditions, rainy season, age variation. (Sardar et al., 2006)**

**Prevalence of *Toxocara spp* infection in cattle was higher with the report of (Iqbal et al., 2007), Akoyl 1993, Chowdhury et al. 1993 and Alim et al 2011), who recorded 8.48% infection in Pakistan,5.1% in Turkey and 6.6% and 5.55% in different areas of Bangladesh, respectively. But , the earlier findings varied widely from the reports of (Avicoglu and Balkaya2011) and Sardar et al 2006) who recorded 22.2% infection in Turkey, 17.22%(native) and 21.67% cross in Mymensingh district ,Bangladesh, respectively. Conversely, lower prevalence of *Toxocara spp* infection was observed by (Saravanna et al 2009), Mahieu and Naves2008, Lay et al., 2008 and Jimeneaza et al., 2007) who observed 1.4% in India, 0.77% in calves in Guadeloupe, 2.3% in Myanmar and 0.0% (dairy cattle),1.8% (beef cattle),in Costa Rica, respectively. The findings of this study is similar with (Samad et al2004), who recorded 14% infection of *Toxocara spp.* Variation of prevalence might be due to geo-climatic diversity, animal enterprises, husbandry measures, nutritional status, deworming etc (Hansen and Perry, 1993).**

**Prevalence of *Moniezia spp* infection was varied from the reports of (Saravanna et al., 2009), Samad et al.,2004) and Yldrm et al.,2000), who observed 1% in India. Nakazawa (1986)**

**observed 1.7% infection in Hokkaido, Japan and Thedoropoulos et al. (2010) observed 0.4% in Greece which also supported findings of this study. Prevalence of *Moniezia spp* infection similar(4%) with the report of (Shirale et al2008) but lower than (Sardar et al.2006 and Borges et al 2001), who recorded 4.18% in Akola district ,India 8.33% (native), 9.44% (cross) in Mymensingh district ,Bangladesh and 4.46% in Jaboticabal, Sao Paulo state, Brazil ,respectively. Lower prevalence of *Moniezia spp* might be due to less dissemination of eggs in feces from the gravid segments (Radostits et al., 1994).**

**5.2 Age wise prevalence of gastrointestinal parasites**:

In current study, influences of age on the prevalence of gastrointestinal parasitic diseases were observed. The prevalence of GI parasitic infections especially, *Fasciola* spp, *Paramphistomum* spp, *Oesophagostomum* spp and *Moniezia* spp were found more in young cattle than adult and calf. Prevalence of *Paramphistomum* spp were found more in young cattle which was similar with the observation of (Reza et al., 2007, Regassa et al ., 2006) ,Shah –Fischer 1989 and Dunn 1978), who recorded significantly higher prevalence of helminth in younger animals than adult. In this study, higher prevalence of parasitic infection in young cattle might be due to sudden exposure to grassland containing egg of parasites and lack of immunity against these infection. The prevalence of *Toxocara* spp infection was highest in calf which was supported by the reports of (Lay et al., 2008), Sardar et al., 2006, Aydin et al., 2006 and Bachal et al., 2002), who recorded the infection in early months of life. Higher prevalence might be due to prenatal infection through transfer of 3rd larval stage and post-natal infection by poor hygienic condition (Lay et al., 2008, Urquhart et al., 1996 and Soulsby, 1982).

**5.3 Sex-specific prevalence of gastrointestinal parasitic infection:**

In the present study, infection caused by Paramphistomum spp was found predominant in female than male cattle. Findings of this study was found in accordance with the reports of (Davila et al.2010, Raza et al. 2010 and Al- Shaibani et al.2008) who also reported higher prevalence of helminthes in female cattle. On other hand, Toxocara spp and Fasciola spp. infection were more in male than female cattle which was found in accordance with the reports of (Rekwot and Ogunsusi 1985 and Soulsby 1982). In this study, variation in occurrence of such helminthes in male and female cattle might be due to variation in sample size (Bachal et al., 2002) ,stress ,genetic resistance of host and insufficient/imbalanced feed against higher needs (Raza et al., 2010 and Hansen and Perry, 1993).