

# Occurrence of Gastrointestinal Parasitism of Cows and Therapeutic Efficacy of Albendazole in Tehsil Tandlianwala, Faisalabad

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## Abstract

Parasitism is a relationship between the organisms in which one lives as a parasite on another and is the main health problem of cattle and all other domesticated ruminants all over the world. The major problems in cattle confronted are; *Fascioliasis*, *Paramphistomiasis* etc because of presence of various helminthes parasites in the GIT (gastrointestinal tract) of the cattle resulting in huge economic losses to livestock industry. The present study was designed to investigate the prevalence of gastrointestinal parasitism of cattle and therapeutic efficacy of albendazole with the dose rate of 5mg/kg body weight in tehsil Tandlianwala, Faisalabad, in the months of January to April, 2017. For this purpose, a total of 384 cattle were selected and fecal samples were directly collected per rectum with sterilized gloves for every animal in plastic containers. The collected fecal samples were managed and inspected using qualitative practices (floatation and sedimentation) and measurable parasitological practices using McMaster egg counting approaches. Those fecal samples positive for *Strongyles*, *Trichuris*, *Toxocara*, and *Monezia* were subjected to egg yield (eggs per gram, EPG) of feces count using McMaster egg counting practice and the degree of infestation was branded. It was deduced from the results that out of 384 animals; 146 animals were infested with mentioned worms showing 38.02% prevalence of the gastrointestinal parasites in cattle in the months of January, February, March and April in Tehsil Tandlianwala, Faisalabad. Furthermore, the infested animals were treated using albendazole and 103 animals were recovered with it revealing 70.54% therapeutic efficacy of the drug.

**Keywords:** Albendazole; Anthelmintic; Ascariasis; Fasciolosis.

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## 1. Introduction

Animals sector, constantly a sub-sector from claiming agriculture, assumes an essential part over economy for Pakistan, its commitment will be around 58.6%, agribusiness esteem included and 11.6% of the GDP about Pakistan [1]. Livestock enterprise substantially contributed to livelihood of poor farmer's community in Pakistan and plays significant role in poverty alleviation and also strengthened the socioeconomic status of pastoralist [2, 3]. Animal census of Pakistan in 2004-2005 reported 26.3 million numbers of buffaloes, 24.2 million heads of cows, 56.7 million goats and 24.9 million heads of sheep. Ministry of food, agriculture and livestock reported the production of milk, beef and mutton as; 29438, 1115 and 739 thousand tons per annum, respectively in 2004-2005 [4, 5].

Parasitism in livestock is one of main confronted problems affecting wide diversity of mammals including buffaloes, cows, goats, sheep and other mammals. Parasitic ailments create great hurdles in the development and extension of livestock production in Pakistan [6, 7]. Pakistan is endemic for parasitic infestations and it costs more than 26.5 million loss yearly to the livestock enterprise [8]. As a consequence of parasitism, animals suffer from production losses in terms of meat, milk, wool production, animals get susceptible to various bacterial, viral and protozoal ailments, denunciation of meat quality, carcass and organs [9].

The GI tract of buffaloes and cows anchorage various gastro-intestinal parasites specifically helminthes, as a result of which clinical and subclinical parasitism occurs consequentially. There are significantly adverse effects of these parasites on the health conditions of the animals as well as prone the economy of the livestock industry to decline [10]. Health of the animals is at significant risk owing to parasitism, also affecting the reproductive and production capacity of the animals. Among parasitism, the gastro-intestinal parasites were termed the most deadly parasitism [11]. Furthermore, predisposing-factors of gastro-intestinal parasitism involved grazing habits, nutritional insufficiency, climate, pasture management, immunological status, vector presence, intermediate host presence and incidence of infective eggs and larvae presiding the host environment [10, 12].

The mature parasites result in the production of toxins invading the erythrocytes and lead to their destruction, as a result of which ischemic and anemia conditions happen. Immature parasites do migrate across the body tissues, thus opening the way for opportunistic microbes, bacteria and fungi and cause other complicated conditions [13].

Important gastro-intestinal nematodes of the family bovidae include *Strongylus* (Trichostrongylidae), *Trichuris* species, *Haemonchus* species *Ostertagia* species, *Nematodirus* and *Cooperia* species [14].

Anthelmintic drugs are devised to control and heal the nematodal parasitic ailments. Yet, these anthelmintic drugs proved an expensive treatment, also not much effective in the control and treatment of the parasitic ailments because drugs can partially control and yield widespread and substantial anthelmintic drug resistance in buffaloes and cattle [15]. According to this significant and global drugs resistance problem, there is dire need of epidemiological studies of GIT parasitism, so that better and effectively strategic approaches can be devised for the control and prevention of parasitic ailments [16]. It is mandatory to control the GIT helminthes through

wise management like in developed countries, for which knowledge of their prevalence is the utmost requirement [7].

## 2. Materials and methods

### 2.1 Study area

The study was conducted for five weeks in Tandlianwala Faisalabad, a town in Punjab, Pakistan. It is located 45 km from the city of Faisalabad and 46 km from Okara. It is a sub-division of Faisalabad District. Tandlianwala stands in the rolling flat plains of northeast Punjab, between longitude 73°13 east, latitude 30°03 North, with an elevation of 183 meters (600 ft) above sea level. The proper city covers an area of approximately 40 square kilometers (15 sq mi), while the tehsil covers more than 1,280 square kilometers (490 sq mi). The Ravi river flows about 9 km in the east which is the main source of irrigation meeting the requirements of 90% of cultivated land.

### 2.2 Sample size estimation

Sample size was calculated by keeping 50% expected prevalence with 95% Confidence interval limits and 5% desired absolute precision. Sample size was reached by using the following equation [17]:

$$n = 1.96^2 P_{\text{exp}} (1 - P_{\text{exp}}) / d^2$$

$$n = \frac{1.962 \times 0.50 \times (1 - 0.50)}{(0.05)^2}$$

$$n = 384$$

where;

n = Required sample size

$P_{\text{exp}}$  = Expected prevalence (50%)

d = Desired absolute precision (0.05)

The selected animal related data including clinical examination, complete animal history and other management factors were recorded on the questionnaire. Appendix-1 has that questionnaire.

## **2.3 Study design**

### **2.3.1 Collection of fecal Samples**

Fecal samples were directly collected per rectum with sterilized gloves for each animal. Each sample was put in plastic containers with lids and labeled with animal identification record including the age, sex, body condition (thin, moderate and good) based on literature location, and date of anthelmintic treatment was recorded with indelible pen and 10 ml of 10% formalin was added into sample container. Then, the samples were kept in refrigerator at 4°C for examination.

### **2.3.2 Coprological examination**

The collected faecal samples were processed and examined using qualitative techniques (floatation and sedimentation) as described [18] and quantitative parasitological techniques by using McMaster egg counting methods according to the standard procedures [19]. Those fecal samples positive for were subjected to egg output (eggs per gram, EPG) of feces count *Strongyles*, *Trichuris*, *Toxocara*, and *Monezia* using McMaster egg counting technique [20] and the degree of infestation was categorized based on literature [21]. Sodium chloride was used as flotation fluid for this study by preparing in the laboratory.

### **2.3.3 Therapeutic Efficacy of Albendazole**

- ▶ Affected cattle were treated using Albendazole @ 5mg/Kg body weight, orally
- ▶ 2<sup>nd</sup> dose was given to the affected animals after 7 days
- ▶ Five days post treatment (2<sup>nd</sup> dose) the cattle were again examined for the presence of GI parasites for the evaluation of the efficacy of the treatment

## **3. Results**

A total of 384 fecal samples were collected aseptically from the rectum of the cattle for the determination of prevalence Gastrointestinal parasites in cattle in Tehsil Tandlianwala district Faisalabad, Punjab province, Pakistan, in the months of March, April and May. The fecal samples were prepared, then microscopically examined under oil immersion lens, for the detection of Gastrointestinal parasites.

Overall results of the study revealed that 55 blood samples tested for Gastrointestinal parasites were found positive, showing 14.32% cattle in Tehsil Tandlianwala district Faisalabad, Punjab province, Pakistan. The prevalence was calculated using the following formula [17]:

$$\text{Prevalence (\%)} = \frac{\text{Number of animals positive}}{\text{Total number of animals sampled}}$$

$$\text{Prevalence (\%)} = \frac{146}{384} \times 100 = 38.02\%$$

Another part of the research was the determination of chemotherapeutic response to the standard treatment regimen. For this purpose, all of the affected cows (n=146) were treated with Albendazole @5mg/kg body weight and 103 of the animals were recovered with the treatment in terms of diminished clinical signs and parasite from fecal samples.

All of the 146 positive animals were treated using Albendazole @ 5mg/Kg body weight, orally. 2<sup>nd</sup> dose was repeated after 7 days. Five days post treatment (2<sup>nd</sup> dose) the cattle were again examined for the presence of GI parasites and it was found that there was significant decrease in the number of eggs of parasites in the fecal samples of all animals under investigation. And it was found that out of 146 animals treated 103 animals were recovered in terms of decrease in number of eggs and larvae in the feces of the affected animals examined microscopically revealing 70.02% therapeutic efficacy of the albendazole for the treatment of the gastrointestinal parasites in cattle.

**Table 1:** Occurrence of Gastrointestinal Parasites in Cows

<b>Parasite</b>	<b>No. of positive animals</b>	<b>Total number of animals examined</b>	<b>Prevalence %</b>
<i>Fasciola</i>	31	384	10.91
<i>Strongyles</i>	35	384	9.11
<i>Trichuris</i>	24	384	6.25
<i>Ascaris</i>	33	384	8.59
<i>Monezia</i>	23	384	5.98
<b>Total</b>	<b>146</b>	<b>384</b>	<b>38.02</b>

#### 4. Discussion

The GI tract of buffaloes and cows anchorage various gastro-intestinal parasites specifically helminthes, as a result of which clinical and subclinical parasitism occurs consequentially. There are significantly adverse effects of these parasites on the health conditions of the animals as well as prone the economy of the livestock industry to decline [10]. Health of the animals is at significant risk owing to parasitism, also affecting the reproductive and production capacity of the animals. Among parasitism, the gastro-intestinal parasites were termed the most deadly parasitism [11]. Our study was to determine the prevalence of gastrointestinal parasites in cows in Tehsil Tandlianwala, District Faisalabad in the months of January, February, March and April and therapeutic efficacy of albendazole drug for the treatment and control of these helminthes.

It was revealed in our study that 38.02% of the total animals were affected with the helminthes. Among these worms, most prevalent was *Fasciola*, showing the prevalence of 10.91% followed by *Strongyles*, *Ascaris*, *Trichuris* and *Monezia*, revealing overall prevalence percentage of 9.11, 8.59, 6.25 and 5.98%, respectively.

All the affected animals were treated using albendazole drug @5mg/kg body weight and all of the 146 animals were treated, after which the dose was repeated at 7<sup>th</sup> day post administration of the first dose of albendazole. It was determined that 103 out of 146 animals were recovered using albendazole drug evaluated on the basis of fecal examination of the treated animals.

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