



## Incidence of Gastrointestinal Parasites in Beetal Goats at District Peshawar, Pakistan

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**Abstract** | Gastrointestinal parasitism is a serious threat to the production capacity of small ruminants throughout the world. This study was conducted to determine the incidence of gastrointestinal parasites and associated risk factors. For this purpose total of 100 fecal samples were collected from suspected goats and processed for qualitative and quantitative examination of gastrointestinal parasites through floatation technique and McMaster technique. Incidence of intestinal parasites was; *Hemonchus contortus* (34%), *Strongyloids papillosus* (25%), *Trichostrongylus* (5%), *Dictyocalus vivifarous* (1%), *Eimeria* (4) and *Trichuris* (1%), respectively while mixed infestation was recorded in 30% cases. Age wise incidence was recorded significantly ( $P < 0.05$ ) higher for young animals (61%) as compare to adult animals (39%). Similarly, significantly ( $P < 0.05$ ) higher incidence was observed in hot-rainy season (73%) as compared to dry-cold (27%). Young animals are more susceptible to gastrointestinal parasites due to lack of immunity development and adaptation to environment. Season is considered as an important indicator of gastrointestinal parasites in goats because hot season favor the sporulation of oocytes and larval development.

**Keywords** | Gastro-intestinal parasites, Beetal goats, Season, Floatation technique, McMaster technique

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## INTRODUCTION

The goat is distributed worldwide and is among the earliest animals domesticated by humans (Di Cerbo et al., 2010). The world's goat population in 2004 was estimated to be over 743 million of which most of them were found in developing countries (Galan, 2005; Di Cerbo et al., 2010). Goat population in Pakistan is about 64.9 million in which 9.59 million are in Khyber Pakhtunkhwa (PES, 2013-14; Shah et al., 2017). Parasitic infestation in the Gastro-intestinal tract is a serious threat to small ruminant production systems worldwide. Single or mixed infestation with protozoans like *Eimeria* and gastrointestinal (GI) nematodes had been reported to constrain goat production worldwide (Sharma et al., 2009). It causes considerable economic loss to the goat industry in terms

of mortality, decreased productivity, stunted growth, loss of body weight and treatment cost (Gwaze et al., 2009; Akhter et al., 2011; Hassan et al., 2011). The severity of the GI parasitic infestation in goats could be due to the vulnerability of goats to internal parasites, which might be from their poor immunity compared to other species of livestock. The incidence of parasitic infestation vary and clinical diseases may or may not occur due to various environmental factors in different areas (Sharma et al., 2009). A high prevalence of GI nematodes and coccidial oocysts were reported in countries with tropical and temperate regions such as India, Bangladesh, South Africa, Sri Lanka, Italy and Mongolia with the prevalence rate ranging from 20–96% (Faizal and Rajapakse, 2001; Sharkhuu, 2001; Gwaze et al., 2009; Sharma et al., 2009; Di Cerbo et al., 2010; Hassan et al., 2011). Keeping in view the importance

**Table 1:** Prevalence of gastrointestinal parasites.

GI parasites	<i>Hemonchus contortus</i>	<i>Strongyloides</i>	<i>Tricho-strongylus</i>	<i>Dictyocalus</i>	<i>Eimeria</i>	<i>Trichuris</i>	Mixed
Prevalence (%)	34	25	5	1	4	1	30

**Table 2:** Prevalence of gastrointestinal parasites with respect to age and season.

Variables	Category	Prevalence (%)	P-value
Age	Young	61	0.003
	Adult	39	
Season	Hot-rainy	73	0.000
	Dry-cold	27	

of gastrointestinal parasites in goats, the present study was designed with the objectives to study the incidence of gastrointestinal parasites in Beetal goats and to determine the associated risk factors.

## MATERIALS AND METHODS

### STUDY AREA

This study was carried out from December 2015 to December, 2016 on the nucleus flock of the Beetal goats reared at Livestock Research and development station, Surezai, and was completed in collaboration with Center of Parasitology and Poultry, Veterinary Research Institute, Peshawar.

### SAMPLE COLLECTION

Fresh fecal samples were collected and transferred to the Center of Parasitology and Poultry, Veterinary Research Institute, Peshawar in sealed and labeled plastic containers in an ice- box.

### PROCESSING OF SAMPLES

Qualitative and quantitative parasitological examinations was performed by fecal floatation technique following standard procedures by using saturated solution of sugar for the presence of parasitic eggs/oocysts (Zajac and Conboy, 2006; Khan et al., 2017). The parasitic eggs/oocysts were examined and identified by microscopy based on the morphology and size of the eggs/oocysts up to the parasite genus level. For quantitative analysis, the modified Mc-Master technique was used to estimate eggs/oocysts per gram (EPG/OPG) of feces.

### STATISTICAL ANALYSIS

Chi-square test was used to analyze the significant difference among the proportions, whereas P-value <0.05 was regarded as significant.

## RESULTS AND DISCUSSION

The present study was conducted in Livestock Research and Development Station, Surezai from December, 2015

to December, 2016. During the study period fecal samples were collected in sterile containers and processed for gastrointestinal parasites. Incidence of intestinal parasites was; *Hemonchus contortus* (34%), *Strongyloides papillosus* (25%), *Trichostrongylus* (5%), *Dictyocalus vivifarous* (1%), *Eimeria* (4) and *Trichuris* (1%), respectively, while mixed infestation was recorded in 30% cases (Table 1). Results of present study about incidence of gastrointestinal parasites are partially congruent with the studies carried out by various researchers (Mhoma et al., 2011; Gebeyehu et al., 2013; Singh et al., 2013) as *Hemonchus contortus* was not recorded as prevalent specie of intestinal parasites in goats. This difference in results might be due to the variation in geographical and climatic condition as in recent study sampling region offers favorable environment for the *Hemonchus contortus*.

Sub-clinical infestation having EPG/OPG<1000 for goats was recorded as 63% while for clinical cases EPG/OPG>1000 it was recorded as 37%. Although a light degree of infestation was observed in the current study for most of the GI parasites. EPG/OPG with <1000 has been reported to negatively affect the weight gain of goats. This statement was supported by the findings of Faizal and Rajapakse (2001), Gebeyehu et al., (2013). Even light infestation of GI parasites leads to debilitating condition of goats and in young animals if left un-noticed may results in mortality (Akhter et al., 2011).

Age and season were found as risk associated factors for gastrointestinal parasites in goats in the present study (Table 2). Incidences of gastrointestinal parasites were recorded more in young (61%) age group animals as compared to adult (39%) age group. Statistical significant (P<0.05) relation was recorded in between of gastrointestinal parasites and age during the study. In young animals parasitism is found more comparatively due to lack of development of protective immunity and adaptation to local environment. These results are in agreement with the findings of Gwaze et al. (2009) but not supported by Dinka et al. (2010), Gebeyehu et al. (2013) because the sampling size from young animals in their studies were too low comparatively.

Season is considered as an important risk factor for the gastrointestinal parasites. In the present study incidence of gastrointestinal parasites were found high in hot and humid season while lower in cold months of the year, respectively and the difference was statistically significant (P<0.05). This might be related to the availability of fodder and a extended browsing in the warm-rainy season by animals (Pathak and Pal, 2008). Sufficient moisture, and

temperature, creates favorable conditions for oocyst sporulation, larval development, and survival of the infective larval stage in the environment (Faizal and Rajapakse, 2001).

It was concluded from the results that gastrointestinal parasites are prevalent in goats of the study area. Furthermore, it was observed that age and season are the two potential risk factors for the occurrence of gastrointestinal parasites in small ruminants.

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## AUTHOR'S CONTRIBUTION

MS and NI conceived the idea of the manuscript. MS and NI organized grouping of animals and collected the samples and data. IAS and AR supervised the sample collection process. SSAS and MIK processed the samples. SSAS and MS analyzed the data and wrote the whole manuscript which was reviewed by all the author. All authors reviewed the draft of the manuscript.

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