



## GASTROINTESTINAL PARASITE OF GOAT (*Capra hircus* L.) SLAUGHTERED IN BACHIRAWA ABATTOIR, KANO STATE NIGERIA

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### ABSTRACT

**The study was aimed to determine the prevalence of gastrointestinal parasites of *Capra hircus* L. (goats) in Kano, Northern Nigeria. A total of 230 fecal samples were collected from male and female goats brought to the Bachirawa Abattoir, Kano for slaughter from March through September, 2017. Flotation technique was employed for the detection/isolation of gastrointestinal parasites eggs in the fecal samples using microscope. The result indicated six parasites ova from different genera in the samples examined. These include; *Strongyloides* sp, *Haemonchus* sp, *Trichuris* sp, *Eimeria* sp, *Moniezia* sp and *Entamoeba* sp. *Haemonchus* sp. was the most prevalent parasite encountered 34 (26.8%), followed by *Strongyloides* sp 23 (18.1%), *Eimeria* sp 22 (17.3%), *Trichuris* sp 21 (16.1%) while *Entamoeba* sp 16 (12.6%) and *Moniezia* sp was the least prevalent 11 (8.7%). It was also found that female goats are more susceptible to gastrointestinal parasite than male goats. Similarly, more parasites are found among adult goats than younger ones. Statistical analysis of the result showed no significant difference in the prevalence of gastrointestinal among different categories of goats examined at  $p < 0.05$ .**

**Keywords:** Abattoir, *Capra hircus* L., Gastrointestinal parasites, Bachirawa, Kano

### INTRODUCTION

*Capra hircus* L. (Domestic goat) is one of the earliest animals domesticated by man. They are distributed worldwide with higher concentrations in tropical areas and in dry zones (Di Cerbo *et al.*, 2010). Goats are excellent meat producers for human consumption in view of its short generation intervals and rich sources of protein and can help bridge the gap of protein malnutrition among consumers (Ozung *et al.*, 2011). Thus, goats are primarily reared for meat and manure and regarded as one of the important animal species for generating cash income by farmers (Gatenby *et al.*, 1990). As such the diseases of these animals are of great economic importance to humans.

Gastrointestinal parasites are considered as the major diseases causing organisms of ruminant animals such as cattle, sheep and goats. Helminths parasite infections in such animals are of the major importance in many agro-ecological zones and are primary factor in the reduction of production and productivity of livestock (Hassan *et al.*, 2013). Economic impact of gastrointestinal (GI) parasites in livestock industry encompasses mortality and morbidity losses, enhanced susceptibility to diseases and

losses resulting from condemnation of carcasses and viscera as well as cost of drugs and veterinary aids (Rajakaruna and Warnakulasooriya 2011). Therefore, the gastrointestinal parasitism is considered as one of the major constraints for profitable livestock industry in tropical and subtropical countries including Nigeria (Johannes *et al.*, 2009). It was also revealed that, trematode (flake) and cestode (tapeworm) parasites may also contribute to detrimental worm burdens in animals (Rahmann and Seip, 2006). Protozoan diseases like amoebiasis, giardiasis, coccidiosis has been reported from different countries like Thailand, Costa Rica and India (Jittapalapong *et al.*, 2011). Important groups of the gastrointestinal parasites known to infect livestock such as goat include the coccidian parasites, nematodes, cestodes, and trematodes (Rahmann and Seip, 2006; Onaga *et al.*, 2009). The gastrointestinal nematodes are regarded as one of the most important groups causing recurring economic losses to livestock production systems throughout the world due to morbidity and mortality.

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Further, it causes emaciation, anemia, hypoproteinaemia, oedema, weakness, diarrhea and death. Sanyal *et al.* (1996) reported that, the parasitic gastritis dominated by haemonchosis, was a major constraint to the profitable sheep and goat production in India as the climate is favorable for the development and survival of free living stages of these parasites throughout the year.

Environmental factors and vector abundance have been some of the major factors in the distribution of most parasitic diseases. Gastrointestinal parasites are common in both temperate and tropical countries, but more prevalent in warm countries where sanitation is poor and standard of living is low (Schmidt *et al.*, 2000). Livestock such as goat get exposed to these pathogenic parasitic organisms very early under natural grazing conditions and the effects of infections are influenced by the environment, nutrition, climate and management practices (Lüscher *et al.*, 2005; Blackburn *et al.*, 2011). Several studies indicated high prevalence of gastrointestinal parasite in goats 75.75% in Ibadan, Nigeria (Olanike *et al.*, 2015), 82% in Bangladesh (Shahiduzzaman *et al.*, 2003). Considering the economic importance of gastrointestinal parasite in goats and their implication for public health, the study was conducted to determine the prevalence of gastrointestinal parasites of goats in Kano, Northern Nigeria.

## **MATERIALS AND METHODS**

### **Study Area**

The fecal samples were collected from Bachirawa Abattoir, Fagge LGA Kano State. Kano State is located in the North-west Nigeria located at latitude 11° 30' N and longitude 8° 30' E. It share borders with Kaduna state to the south-west, Bauchi state to the South-East, Jigawa state to the East, Katsina state to the North. It has a total area of 20,131km<sup>2</sup> (7,777sqm) and estimated population of 13.4 million (NPC, 2014).

### **Sample Size Determination**

The sample size for the study was determined from a standard formula for the calculation of minimum sample size (Nasir *et al.*, 2018). Sample size was given by the formula;  $N = (Z_{1-\alpha})^2 (p) (1-p) / d^2$ . Where N = minimum sample size,  $Z_{1-\alpha}$  = value of standard normal deviate which at 95% confidence interval has found to be 1.96, P = the best estimate of prevalence obtained from literature review (82%) and d = difference between the true population rate and sample that can be tolerated, this is the absolute precision (in percentage) on either side

of the population.  $N = (1.96)^2 \times (0.82) \times (1-0.82) / (0.05)^2 = 226.7$  which was rounded up to 230 as the minimum number of samples for the study. Therefore, a total of 230 samples were used in the study.

### **Study population and Sample Collection**

A total of 230 fecal samples were collected using hand gloves from male and female goat brought to the Bachirawa Abattoir, Kano for slaughter from March through September, 2017. A simple structured questionnaire was administered to the goat owners for obtaining goat's details such as age and sex. The fecal samples collected after dropping were placed in a sterile sample bottles and transported to the laboratory in the Department of Biological Science, Kano University of Science and Technology Wudil for further examination.

### **Parasitological Examination**

Fecal samples were examined by flotation techniques for the presence of gastrointestinal parasites ova as described by Cheesbrough, (2005). The fecal samples were crushed and dissolved in normal saline solution (0.9%) in a beaker. The obtained fecal suspensions were filtered using sieve of 50µm size mesh. This was done so as to trap the large particles or debris. The filtrate was placed into a glass slide covered with cover slip for 15mins. It was then mounted and examined under the microscope using X10 objective to determine the presence of eggs (ova) and X40 objective to determine the morphological features of the ova of the helminthes examined.

### **Data analysis**

The data generated were subjected to descriptive statistical analysis using percentages and Chi – square analysis was used in determining the prevalence rates in the gender and age.  $p < 0.05$  was considered indicative of a statistically significant difference.

## **RESULTS**

### **Prevalence of Gastrointestinal parasites among the goats sampled**

The data for the prevalence of gastrointestinal parasite of goat is presented in Table 1 below. The result indicated that the parasites are distributed into six different genera. They include *Strongyloides* sp, *Haemonchus* sp, *Trichuris* sp, *Eimeria* sp, *Moniezia* sp and *Entamoeba* sp. *Haemonchus* sp. was the most prevalent parasite encountered, about 34 times which accounted for 26.8 %, followed by *Strongyloides* sp 23 (18.1%), *Eimeria* sp 22 (17.3%), *Trichuris* sp 21 (16.1%) while *Entamoeba* sp 16 (12.6%) and *Moniezia* sp was the least prevalent 11 (8.7%).

**Table 1: Prevalence of Gastrointestinal parasites**

S/N	Parasite egg	Number positive	Prevalence (%)
1	<i>Strongyloides</i> sp	23	18.1
2	<i>Haemonchus</i> sp	34	26.8
3	<i>Trichuris</i> sp	21	16.5
4	<i>Eimeria</i> sp	22	17.3
5	<i>Moniezia</i> sp	11	8.7
6	<i>Entamoeba</i> sp	16	12.6
	<b>Total</b>	<b>127</b>	<b>100</b>

**Distribution of Gastrointestinal Parasites in Relation to Sex**

The distribution of gastrointestinal parasites in relation to the sex of the goats examined is presented in Table 2. Out of the 230 fecal samples examined, 103 (45.24%) from male

and 127 (54.76%) from female goats. A total of 127 samples which accounted for 55.2 % of samples were positive for one or more gastrointestinal parasites. Higher incidence was found among female (41%) than male (33%).

**Table 2: Distribution of Gastrointestinal Parasites in Relation to Sex of the goats**

Sex	No. examined	No. positive	Prevalence (%)	X <sup>2</sup>
Male	103 (45.24%)	54	23.5	0.1701*
Female	127 (54.76%)	73	31.7	
<b>Total</b>	<b>230</b>	<b>127</b>	<b>55.2</b>	

Key: \*The  $p$ -value is .680056, hence there is no significant different on the distribution of gastrointestinal parasites among the sexes

**Distribution of Gastrointestinal Parasites in Relation to Age**

The distribution of gastrointestinal parasites in relation to the age of the goats examined is presented in Table 3. Out total of 230 goats examined, 91 (39.6%) are below the age of 1

year and are considered as young while 139 (60.4%) are above 1 year. From the result obtained, more parasites were found among adult goats (38.7%) than younger ones (16.5%).

**Table 3: Prevalence of Gastrointestinal Parasites in Relation to Age of the goats**

Age	No. examined	No. positive	Prevalence (%)	X <sup>2</sup>
Young (< 1 year)	91 (39.6%)	38	16.5	3.2975*
Adult (> 1 year)	139 (60.4%)	89	38.7	
<b>Total</b>	<b>230</b>	<b>127</b>	<b>55.2</b>	

Key: \*The  $p$ -value is .069385, hence there is no significant different on the distribution of gastrointestinal parasites among age groups.

**DISCUSSION**

In the present study, 55.2% of the samples examined were infected with one or more gastrointestinal parasites. From the findings of this research, *Strongyloides* sp, *Haemonchus* sp, *Trichuris* sp, *Eimeria* sp, *Moniezia* sp and *Entamoeba* sp were the gastro intestinal parasite of goats observed in this study. The presence of these parasites in this study was in conformity with the findings of Gadahi *et al.* (2009) and Nwigwe *et al.* (2013) who noted that the most pathogenic helminths and protozoan parasites in the intestinal tract of small ruminants such as goat include; *Strongyloides* sp, *Trichuris* sp and *Eimeria* species. High prevalence of gastrointestinal parasite of goats in this study is similar to the findings of Mollah *et al.* (1996) who examined 250 abomasi of goats and recorded *Haemonchus* and *Strongyloides* species

as the dominant helminth parasites in goats and are among the successful parasites of animals because of their efficient life cycle ranging from the very simple to the extremely complicated stage. The prevalence in the present study (55.2%), might be due to the system of management that these goats were subjected to as they were always left to wander about scavenging and feeding indiscriminately on anything they come in contact with and then return to their poorly kept sheds. The goats also exposed to gastrointestinal parasites when they are maintained in an unhygienic and poorly kept ranches and also when fed with contaminated food and water. The presence of protozoan parasites such as *Eimeria* sp and *Entamoeba* may be due to overcrowding, poor management and hygiene.

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The presence of helminth parasites in this study support the finding of Adejinmi and Osayomi (2010) who attributed the presence of protozoan parasites in dog as a result of overcrowding and poor hygienic condition. Poor hygienic condition and overcrowding encourage the spread of gastrointestinal parasites, as the animals become carriers of the intestinal parasites and continually contaminate the environment with eggs of the parasites.

Based on the finding of this study in relation to the sex, female goats are more susceptible to gastrointestinal parasite (31.7%) than male goats (23.5%). This result was in conformity with the finding of Shakya *et al.* (2017) who found higher incidence of gastrointestinal parasites in female goats (46.04%) than male goats (39.5%). Higher incidence among female might be due to genetic predisposition and differential susceptibility owing to hormonal differences (Shakya *et al.*, 2017). Other factors associated with higher incidence of gastrointestinal parasite among female goats include pregnancy and lactational stress (Shakya *et al.*, 2017). In the present study, more parasites were found among adult goats (38.7%) than younger ones (16.5%). However, there is no significant difference on the prevalence of gastrointestinal parasites in relation to the age of the goats at  $p < 0.05$  (0.694). This agrees with the finding of Chedge *et al.* (2013) who found 57% and 22% prevalence of gastrointestinal parasites for adult and young goats respectively. Higher prevalence

of the parasites among adult goats was due to continues grazing on pasture land by the adult in most time and the pasture happens to be infected with infective larvae, as infected adult animals continually shed the eggs gastrointestinal parasites while the young ones which are generally kept at home.

### CONCLUSION

The findings of the present study established a prevalence of gastrointestinal parasites of goats to be 55.2%. A total of six parasites belonging to six different genera were recorded. They include *Strongyloides* sp, *Haemonchus* sp, *Trichuris* sp, *Eimeria* sp, *Moniezia* sp and *Entamoeba* sp with *Haemonchus* sp. being the most prevalent parasite encountered. It is found that female goats are more susceptible (31.7%) to gastrointestinal parasite than males one and (23.5%) more parasites are found among adult goats (38.7%) than younger ones (16.5%). However, these variations were not statistically significant. It is recommended that educating goat owners on method of transmission and effect of these parasites should be encouraged.

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