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RESEARCH ARTICLE

Prevalence of Gastrointestinal Parasites of Goat and Sheep Slaughter at Bauchi Central Abottoir, Bauchi, Nigeria

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Abstract

A total of 100 fecal samples of sheep and goats of 50 goats and 50 sheep wereexamined. These samples were processed by floatation and sedimentation method for the detection of parasitic egg. Egg of parasites were identified through their morphological features using the available keys. The prevalence rate for goat was (47.5%) while for sheep was (52.5%). The overall occurance of gastrointestinal parasites encountered for goats and sheep were Avetellina centripunctata (5.10%), Bonustumum trigonocephalum (1.02%), Congylonema pulchrum(1.02%),Cotylophoron cotylophorum (1.02%), Cryptosporidium (9.18%), Cyclospora(3.10%), Dicrocoeleum dentriticum (3.10%), Eimeria spp (2.04), Fasciola spp (15.31%), Gargeria (2.04%), Gargeria (2.04%), Giardia (1.02%), Haemachus (2.04%), Nematodirus (2.04%), Obstertagia circumcinta (1.02%), Oesophagostomum columbianum (12.24%), Paraphistomum (1.02%), Spotheget ostertagia (1.02%), Strongyloides (34.69%) and Trichuris (1.02%). gender wise prevalence of gastrointestinal parasites was higher in female (75%), than male (25%) (P<0.05). The young ones were more infected: (43.75%); compared to the adults'ones: (33.75%) (P>0.05). In conclusion, the data obtained in this study suggest that the age, sex, are important factors which influence the prevalence of gastrointestinal parasites.

Keywords: Gastrointestinal Parasite, Sheep, Goats, Abattoir, Prevalence.

1. Introduction

1.1 Background of the Study

Gastrointestinal parasites are usually classified into nematodes, trematodes and cestode which are the three major types of parasitic helminthes of economic importance in sheep production (Abdu *et al*., 2013). Nematode causes the most pathologies and production loss in sheep (Aga *et al*., 2013). Moreover, studies have shown that some of sheep gastrointestinal parasites are of public health importance and they were indicted in zoonotic transmission to human either by direct contact with sheep feces or indirectly through consumption of contaminated water or food (Bhaia *et al.,* 2010). Majority of farmers in Nigeria raise their livestock under extensive or semi-intensive production system as an addition to main agriculture activities (Knipscheer *et al.,* 1983). Most of these non-nomadic farmers buy their stock from the Fulani nomads who actually keep livestock as the main activity for sustenance and income generation.

Gastrointestinal parasites (GIPs) are considered as a major constraint affecting the productive performance of sheep and goats throughout the world including Nigeria (Okorafor *et al.,* 2015).

These parasites do not only affect the health but the productiveandreproductiveperformanceoftheanimals

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which leads to loss in body weight, poor reproductive performance, digestive disturbance, emaciation for long periods and increased susceptibility to other infections (Molla *et al*., 2016).

Prevalence of gastrointestinal parasite infection in livestock varies according to the existing climatic condition and management practices (Kumar *et al*., 2016). The environmental factors like temperature, rainfall and humidity play an important role in the development and survival of pre-parasitic stages (Nemomsa *et al*., 2013).

Therefore, it is important to estimate the possible variation in parasitic infection of each host species of animals in different geographical regions and which could help to design effective control measures against the parasitic diseases (Singh *et al*., 2015). These animals are much prone to parasitic infestations where their gastrointestinal tract harbors a wide variety of parasites like helminthes and protozoa etc. which causes clinical and sub clinical parasitism (Adejinmi *et al*., 2015)

GIPs are considered significant diseases causing organisms of small ruminants (goat and sheep) in Nigeria. Helminths parasite infections in goat and sheep are of the major importance in many agro-ecological zones and a primary factor in the reduction of small ruminant production (McRae, *et al.,* 2014). Sheep and goats of all ages are parasitized by a host of helminthic parasites. Species found within nematodes occupy several niches within their mammalian host ranging from intestinal lumen to intravascular or even intracellular sites. Depending on the site of infections GIPs cause diseases, reduced growth rate, substantial loss of productivity, distention, weight loss, abortion, infertility, anorexia, anaemia or death in severe cases (Hansen, and Perry, 1994).

In the tropics the warm and humid climatic condition, the region provide favorable environment for development of worm eggs to infective larvae, thus apart from nutritional problems helminthosis is a limiting factor in the improvement of livestock due to production losses, increase cost of management and treatment and even mortality in severe cases. While among flukes, liver flukes, particularly, *Fasciola spp*. was the major threat for sheep and goat production (Urquhart, *et al*., 1996). Also, tiny liver flukes such as *Dicrocoelium spp*. and rumen flukes (*Paramphistomum spp*.) were comparatively less important for sheep because only few sporadic losses had been caused by them]. Clinical and sub clinical signs of the disease, such as diarrhea, mortalities affect mainly young animals, anorexia, emaciation and poor reproductive performance and even death (Singh, *et al.,* 2015).

Sheep are highly susceptible to GIPs due to their lower innate immune response against specific Helminths as a result of their evolution. This is further exacerbated by the nomadic nature of sheep husbandry in Nigeria. The challenge is, however, much more severe in tropical countries due to favorable environmental conditions for GIP transmission, poor nutrition of the host animals, and poor sanitation in rural areas. This makes controlling GIPs the most important health issue in sheep of all ages. The prevalence of GIP infection in livestock varies according to their existing management practices, season of the year, age of animal and sex (. Matebesi, 2014). Several epidemiological studies have been carried out elsewhere on GIPs among sheep in Nigeria but not in this sheep and goats farming community where eighty-five percent of the farmers use sheep as one of their sources of livelihood, income, children's school fees and procurement of crop farming implement.

Helminthiasis is a chief cause of monetary losses in ruminants worldwide (Ferre *et al.,* 1995). GI helminthes are considered as one of the utmost significant and underrated problems, which hinder goat and sheep production (Perry and Randolph, 1999). In a survey, carried out by Perry *et al.* 2002 it was conclusively found that amongst GI helminthes, nematode had great impact on survival and productivity of sheep in developing countries. While among flukes, liver flukes, particularly*, Fasciola spp*, was the major threat for goat and sheep production (Hansen and Perry 1994; Urquhart *et al.,* 1996). Also, tiny liver flukes such as *Dicrocoelium spp*. and rumen flukes (*Paramphistomum spp*.) were comparatively less important for sheep because only few sporadic losses had been caused by them (Urquhart *et al*., 1996).

2. Materials and Methods

2.1 Study Area

This study is aimed to be conducted at Bauchi central Abattoir, Bauchi State. Bauchi is a city in North East Nigeria. The capital of Bauchi Local Government Area within the state of the traditional Bauchi Emirate. It is located on northern edge of Jos, Plateau state. The Local Government Area covers an area of 3,637km² and had population of 493,810 at the time of 2006 census. Bauchi is located at 10.31º North

latitude 9.84º East longitude and 616meters above the sea level. However, in terms of climate according to koppem climate classification system, Bauchi has a tropical savannah climate, abbreviation "Aw" on climay maps.

2.2 Sample Collection and Handling

A total of 200 fecal samples is to be diagnose; 100 from goat and sheep is to be used for the research work. About 10g of fecal sample will be collected from the abattoir using disposable hand gloves and freshly fecal samples obtained will be place in a sample container label and be carry in a flask (cooler) with ice packs then be transported to parasitology laboratory as soon as possible for analyses using direct microscopic examination, floatation and sedimentation techniques. Identification of the eggs or cysts was made on the basis of morphological characteristics and size of eggs.

2.3 Parasitological Examination

2.3.1 Macroscopic Examination

The fresh and unpreserved fecal sample will be examined macroscopically in terms of consistency, colour, form, formed, semi formed quantity and presence of mucus and body mucus, sex, age, species, date.

Form, formed, semi formed, soft, loose and watery.

Gardia trophozoite (trichorome) lodamoeba cyst (trichrome) pin worm (iodine).

2.3.2 Microscopic Examination

The processed fecal sample collected will be examined microscopically to determine protozoan trophozoite cysts, oocysts and helminth eggs,

2.4 Identification of the Parasite

2.4.1 Eggs and Ova Identification

The identification of egg of the parasite will be performed by their characteristic's morphological features of their egg, oocysts and larvae as described by Soulsby (1982) and Rahman *et al., (1996).*

3. Result

3.1 Rate of Infection with Parasites Among Different Study Animals

Of the 100 animal faecal samples used for this study, goats were 50 and sheep 50. The percentage infection among the different animals shows sheep with the highest of infected animals with 42(52.5%), while goat infected animals with 38(47.5%).

3.2 Prevalence of Gastrointestinal Parasites in Relation to Gender and Age of the Animals

The floatation and sedimentation, out of the 100 faecal samples 50 of goat and 50 of sheep result in 80 (80%) harbors one or more parasites. With respect to the gender and age, the prevalence of GIT parasites between gender and age were revealed to show

3.3 Occurrence of Parasites Among Slaughter Animals in the Study Area

The overall prevalence of gastrointestinal parasites examined in both goat and sheep was 98 irrespective of whether in floatation or sedimentation and the number they occur in a single sample. At the animal level 43

Table 1. *Rate of Infection with Parasites among different Study Animals*

Animals	Number of examined samples	number of infectd (+)	Percentage (%)
Goat	50	38	47.5 %
Sheep	50	42	52.5 %
Total	100	80	100 %

Table 2. *Prevalence of Gastrointestinal parasites in relation to gender of the animals*

Gender	Number of Examined Samples	Number of infectd (+)	Prevalence (%)	X^2	P-value
Male	29	20	25 (%)		3.84
Female	71	60	75 (%)	4.49	

Table 3. *Prevalence of gastrointestinal parasites in relation to age of the Animals*

Age Group	Number of Examined Samples	Number of Infected	Prevalence (%)	X	P-value
5M-11M	45	35	43.75		5.99
12M-23M	24	18	22.5		
24M-36M	31	27	33.75	4.30	

Table 4. *Occurrence of Parasites among Slaughter Animals in the Study Area*

Parasites	Goat			Sheep		S	
	No of Examined	No Positive	Prevalence %	No positive	Prevalence %	Overall %	Prevalence
Avetellina centripunctata	50	0	1.0 %	5	9.09	5	5.10
Bonustumum trigonocephalum	50	0	1.0%	1	1.82	1	1.02
Congylonema pulchrum	50	0	1.0%	1	1.82	1	1.02
Cotylophoron cotylophorum	50	0	0.0%	1	1.82	1	1.03
Cryptosporidium	50	7	16.28%	2	3.64	9	9.18
Cyclospora	50	3	6.98%	0	0.0	3	3.10
Dicrocoeleum dentriticum	50	0	0.0%	3	5.45	3	3.10
Eimeria spp	50	2	4.65%	0	0.0	2	2.04
Fasciola spp	50	12	27.91%	3	5.45	15	15.31
Gargeria	50	0	0.0%	2	3.64	2	2.04
Giardia	50	1	2.33%	0	0.0	1	1.02
Haemachus	50	0	0.0%	2	3.64	2	2.04
Nematodirus	50	0	0.0%	2	3.64	2	2.04
Obstertagia circumcinta	50	0	0.0%	1	1.82	1	1.02
Oesophagostomum columbianum	50	1	2.33%	11	20.0	12	12.2
Paraphistomum	50	0	0.0%	1	1.82	1	1.02
Spotheget ostertagia	50	0	0.0%	1	1.82	1	1.02
Strongyloides	50	17	39.53%	17	30.91	3	34.69
Trichuris	50	0	0.0%	2	3.64	2	2. 04

4. Discussion

A total of 38 (47.5%) samples out of the total of 50 goats were infected with gastrointestinal (GI) parasites, while 42 (52.5%) out of 50 sheep examined were infected with gastrointestinal parasites. This study revealed *strongyle, fasciola* and *Oesophagostomum* species with 34.69%, 15.31% and 12.24% respectively as the most common parasites of small ruminants in the study area.

The most prevalent species of the parasites in goat in this study were Strongyloides (39.53%), *Fasciola* (27.91%), Cryptosporidium (16.28%) other gastrointestinal parasites species encountered were; *Cyclospora* (6.98%) *Eimeria* (4.65%), *Giardia* (2.33%) and *Oesophagostomum columbianum* (2.33%). The various species of endoparsites recovered during present investigation have been reported by various researchers in different parts of the world.

The most prevalent species of the parasites in sheep in this study was Strongyloides (34.69%), Oesophagostomum columbianum (12.24%), Avetellina centripunctata (9.09%). Other gastrointestinal parasite species encountered were; Fasciola (5.45%), Dicrocoeleum dentriticum (5.45%), Haemonchus contortus (4.5%), Trichuris (3.64%), Cryptosporidium (3.64%), Gargeria (3.64%), Paramphistomum (1.82%), Bonustumum trigonocephalum (1.82%), Congylonema pulchrum (1.82%), Cotylophoron cotylophorum (1.82%), Obstertagia circumcinta (1.82%) and Spotheget ostertagia (1.82%).

In relation to gender, the study revealed a low prevalence 20 (25%) of gastrointestinal parasites in males than their female counterparts 60 (75%). The influence of gender was not significantly different. Adua and Hassan (2016) reported that gender does not really have direct influence on the epidemiology and distribution of gastrointestinal parasites among sheep and goats.

In respect to age of the animals studied, young ones recorded the highest number of gastrointestinal parasites 35 (43.75%) than the adult with 27 (33.75%). This finding doesn't agrees with the reports of Nwosu *et al*., (2007) and Ntonifor *et al.,* (2013) which clearly showed that adult animals could have been harbouring matured worms.

Prevalence of helminthes was recorded in the young animals compared with the older ones. Young animals have often been reported to have higher rates of worm infection and burden (Asanji and Williams, 1987; Pal and Qayyum, 1993; Maqsood *et al.,* 1996; Komoin *et al.,* 1999). This may be due to better immune status and establishment of immune competence of the

host because of repeated exposure to worm infection in older age (Silverman and Patterson, 1962). The resistance to establishment of nematodes and the ability to expel established infections increase with age (Manton et al., 1962). This is in contrast to the current results, due to minimal number of young goats examined in this study 13 (23.3%) compared to 43 (76.6%) in adult goats. Giving a percentage of 5.4% compared to the adult goats 32.1%

5. Conclusion

Gastrointestinal parasites are the major animal health constraints in sheep and goat production and contributing loss in productivity and economy. In the present study an overall prevalence of GIT parasites were high with occurrence of mixed infection. The predominant GIT parasites identified were Strongyle spp 34 (34.69%), Fasciola spp 15 (15.31%), *Oesophagostomum columbianum* spp 12 (12.24%) and *Cryptosporidium* species 9 (9.18%). Risk factor like ages and gender were found determinant factors for the occurrence of GIT parasites. From the above findings, a strategic use of anthelmintics and good management should be practice to control the gastrointestinal parasites infection with further study on Seasonal variation and burden of parasites in the study area. The findings of this study revealed that gastrointestinal parasites are endemic in small ruminants in bauchi abattoir. This finding should be of help to veterinarians and livestock workers as they should certify that only healthy small ruminants examined are slaughtered. It will also help farmers in organizing animal husbandry system, maintenance of proper health, feeding and sanitary condition, deworming, towards maximum productivity.

Recommendations

I therefore recommend further research to be carry out to investigate the factors that contribute to the causes of the parasites in the study area (Bauchi).

Also, the state government should create a means of awareness and education programs for the animal farmers.

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