

# Incidence of *Haemonchus contortus* Infection In Free Range House Hold Sheep from Liman Katagum and Bununu Villages, Bauchi State Nigeria

BY

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## ABSTRACT

A Study was conducted in Liman Katagum and Bununu, two Villages of Bauchi Local Government in Bauchi State to determine the Infection Of Local Sheep with *Haemonchus contortus*. A total of 368 animals were examined, 184 from each of the two villages, between the Months of January to April to obtain Data for the dry Season and June to September for Raining season data. Fecal material was collected and subjected to examination in the Laboratory using Floation techniques. A total 58 animals representing 31.52% were found to be infected in Liman Katagum while 9 representing 4.89% were found to be infected in Bununu. More animals 39 representing 21.16% were found to be infected in Dry season than the wet season where only 15.22% were infected. The prevalences of the parasite was found to be higher in Female with 21.43% than Males with 19.9%. Similarly more Adults were found to be harbouring the Parasite *H. contortus* than the young animals. During the Study eggs of other Parasites such as *Oesophagostomum spp*, *Ostertagia spp*, *Trichostrongylus* and *Strongyloides spp* were isolated indicating co infection.

Key word: *Haemonchus contortus*: Free range sheep Bauchi State Nigeria

## INTRODUCTION

Helminthes parasites of sheep caused primarily by *Haemonchus contortus* which is an important infection in many countries. The three most important Sheep/Goat roundworms are *Haemonchus contortus* (Barber's pole Worm), *Trichostrongylus* spp. (Black scour worm) and *Ostertagia (Teladorsagia) circumcincta* (brown stomach worm) (Solomon; 1969). Worms of lesser or occasional importance include *Nematodirus spp*, *Oesophogostomum spp* and *Cheberita ovina*. Liver Fluke (*Fasciola hepatica*) is also important in some location (Stephen, 2003, Whitter, 2003).

In Nigeria studies have been conducted on *Helminth* parasites, such studies include, that which was conducted in Zaria (Fatihu, et al., 1991) and that of Plateau State (Fabiya, 1972). *H. contortus* Presents the greatest concern in the world sheep and goat. Common name of *H. contortus* include stomach worm, barber's pole worm and wire worm (Rick et al; 2000). *Haemonchus contortus* causes economic and production losses to the world sheep producer. According to the recent survey of sheep producers, *Haemonchus contortus* is one of the prominent sheep disease (Stephen et al; 2003). Gastrointestinal nematodosis, especially haemonchosis, is the major cause of staggering economic wars to the sheep industries world wide, particularly in the tropical and subtropical region (Hoody et al; 1999). Despite the fact that sheep production is an agricultural practice in Northern Nigeria, the study areas inclusive, literature on the incidence and prevalence of *H. contortus* is scanty particularly in Bauchi area. Little work has been done on farm animal without corresponding study on free range house stock which could serve as reservoir for the infection. The present study was designed to investigate the incidence of *H. contortus* among

free range sheep with the view of establishing the infection, study the epidemiology in different season and to establish the relationship between the infection and sex of the animals so as to come up with possible control measures that will lead to improvement in the economic income of the farmers.

## Study Areas.

Bauchi State lies in the North Eastern Geo-political zone of Nigeria, between approximately 90°30' -120°30' North and 8° 45' 11' East. It falls within North Guinea Savanna region. The State has a population of (Anon 2006) with over 75% predominantly rural dwellers and farmers (Add Ref and Idachaba, 1985). Liman Kataguma village in Bauchi Local Government and is about 33km from Bauchi metropolis, and Bununu, a settlement in Tafawa Balewa Local Government and it is about 45km from Bauchi metropolis the headquarters of Bauchi State. The study was conducted between January to April 2016 for the dry season and June to September for the wet season

## Inclusion and exclusion Criteria

Animals were Selected through random sampling technique with the assistance of the Area veterinary Officers. House Holds known to be keeping Sheep were invited and owners consented to the collection of Samples from their animals. Animals were tagged for identification. A total of One hundred and eighty four animals were selected each from Liman Katagum and Bununu for the study.

## Collection of samples.

Fresh fecal samples were collected from each animal in two season, rainy and dry season (between Aug. to December, 2014 for rainy season and January to April

2015 for dry Season), early morning hours before the animals are released for grazing. Sex and approximation age of the animal were recorded before collection (Rick *et al*; 2000). The samples were transported in sterile container to the laboratory for Macroscopic and Microscopic examination.

#### **Treatment of Faecal Sample**

Collected *faecal* materials were subjected to floatation and sedimentation technique in accordance with technique described by Rick *et al* (2000) to determine infection with *Haemonchus contortus*.

#### **floatation Techniques**

2mg of fresh faeces was mixed with enough concentrated brine solution in mortar and was grinded to make semi-solid suspension. The suspension was poured into a test tube and was allowed to settle for 15 minute. Been covered with a cover slip. Then the slip was removed and placed in a clean slide upside down and was observed under light microscopic at various magnifications (Rick *et al*; 2000).

#### **Sedimentation Technique.**

2mg of fresh faeces was mixed with 10ml concentrated brine solution. The mixture was strained. The supernatant was discarded. The process was repeated until the supernatant was cleared. The sediment was then transferred to clean slide and was examined microscopically (Rick *et al.*, 2000).

#### **Egg identification**

*Haemonchus contortus* egg was identified by the present of its thin shell with 24 cells (Anon, 2016). For the Confirmation of *Haemonchus contortus*, larvae were cultured from selected faecal materials.

#### **Culturing and Identification of infective larvae**

2g of faeces was placed in a covered jar that had been moistened with 0.1% sodium carbonate to inhibit mould growth. The jar was stored in a drawer at room temperature for week to ten days. The wall of the jar was always covered with droplets of condensed moisture, when drying out, a few drops of sodium carbonated solution was added. After ten days, the jar was returned back to the light. The larvae were seen squirming about in the condensation droplets on the walls of the jar (Rick *et al*; 2000). The collected larvae were concentrated and examined under light microscope. The following features were used to identify the larvae:

1. The presence of slender body, long cylindrical oesophagus and truncated tails.
2. Absence of sheath and presence of medium tail. These confirmed the presence of *Haemonchus contortus* (Rick *et al*; 2000).

#### **Statistical Analysis.**

Chi square analysis was employed to test between the means of area, sex and age of the sheep at 0.05 level of significance.

## RESULTS

The comparison of means of infection of *Haemonchus contortus* in sheep did not show wide variation in season, sex and age at 0.05 level of significance (Table 2,3, and 4). There is significant difference shown between the two studied areas that are Liman Katagum and Bununu at 0.05 level of significant (Table 1).

### Infection in relation to area: -

A total of 368 sheep were examined; 184 sheep (50%) from Liman Katagum, where out of 184 sheep, 58 sheep (31.52%) were infected, 184 sheep (50%) from Bununu where out of 184 sheep, 09 sheep (04.89%) were infected. The infection in Liman Katagum was greater than in Bununu, as shown in table 1 hence, that there was significant difference between them.

### Infection in relation to season

A total of 368 sheep was examined 184 sheep (50%) were examined in rainy season and 28 (15.22%) were infected. 184 sheep (50%) were examined in dry season and 39 sheep (21.16%) were infected. The infection in dry season (21.16%) was greater than infection in rainy season (15.22%) as in table 2.

### Infection in Relation to sex

Out of 368 sheep were examined 214 sheep (58.15%) were males and out of them only 34 (15.90%) were infected. 154 sheep (41.85%) examined from the total of 368 sheep were females and among them 33 sheep (21.43%) were infected with *Haemonchus contortus*. Therefore, there was greater infection in females (21.43%) than in males (15.90%) as in table3.

### Infection in Relation to age

A total of 368 sheep were examined out of this total, 282 were adults (76.63%) and among them 46 sheep (16.31%) were infected. The remaining 86 sheep (23.37%) were younglings in which 21 sheep (24.42%) were infected with *Haemonchus contortus*. The infection level in young is greater than in Adult as shown in table 4.

### Eggs of parasites Isolated

A total of 161 eggs of different parasites were isolated from infected sheep in both Liman Katagum and Bununu 83 eggs (51.55%) were for *Haemonchus contortus* Parasites having the highest number of egg. (02.48%) of *Oesophagostomum venulosum* were isolated representing the least number.

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**Table 1.** Distribution of numbers of posture in the study areas from august, 2008 to April, 2009.

Area	No. Sample	No. of Infection Sheep	No. of Uninfected Sheep
Liman Katagum	184	58(31.52%)	126(68.47%)
Bununu	184	09(04.89%)	175(95.10%)
<b>Total</b>	<b>368</b>	<b>67</b>	<b>301</b>

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**Table 2.** Seasonal Distribution of infection among the sheep sample from August, 2008 to April, 2009.

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Area	No. of Sample		No. of positive		No. Negative		Collected
	Wet	Dry	Wet	Dry	Wet	Dry	
L/Tatagum	92	92	23	35	69	57	
Bununu	92	92	05	04	87	88	
<b>Total</b>	<b>184</b>	<b>184</b>	<b>28</b>	<b>39</b>	<b>156</b>	<b>145</b>	
			<b>(15.22%)</b>	<b>(21.16%)</b>	<b>(84.78%)</b>	<b>(78.10)</b>	

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**Table 3.** Sex Distribution of Sheep sampled in study areas from August, 2008 to April, 2009.

Area	No. of Sample Collected	No. of Positive		No. of Negative		
		Male	Female	Male	Female	Female
Liman	92	27	31	65	61	
Katagum						
Bununu	122	07	02	115	60	
<b>Total</b>	<b>214</b>	<b>34</b>	<b>33</b>	<b>180</b>	<b>121</b>	
		(15.90%)	(21.43%)	(64.11%)	(78.57%)	

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**Table 4.** Age Distribution of sheep sampled in study areas from August, 2008 to April, 2009.

Area	No. of Sample		No. of Positive		No. of Negative	
	Months 0-9	Months 10-20	Months 0-9	Months 10-20	Months 0-9	Months 10-20
Liman	54	130	18	40	36	90
Katagum						
Bununu	32	152	03	06	29	156
<b>Total</b>	<b>86</b>	<b>282</b>	<b>21</b>	<b>46</b>	<b>65</b>	<b>236</b>
		<b>(24.42%)</b>	<b>(16.31%)</b>	<b>(75.58%)</b>	<b>(83.69%)</b>	

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Percentage Prevalence of other Parasites observed during the studies

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<b>Parasites</b>	<b>Percentage Prevalence (n=161)</b>
<i>Haemonchus contortus</i>	82 (51.55%)
<i>Ostertagia ostergia</i>	22 (13.66%)
<i>Trichostrongylus colubriformis</i>	17 (10.56%)
<i>Trichostrongylus vitrinus</i>	10 (06.211%)
<i>Bunostomum trigonocephalam</i>	10 (06.211%)
<i>Strongyloides papillosus</i>	10 (06.211%)
<i>Oestophagostomum colombianum</i>	05 (03.11%)
<i>Oestophagostomum venulosum</i>	04 (02.48%)

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## DISCUSSION

Although the study was aimed at *H. contortus*, a number of other parasites species of nematodes were found in the study animals. This is in conformity with several other results where several species of Nematodes were found in one single animal. Fabiyi, (1972) reported same in Plateau State which is Neighboring Bauchi state, the resent Study area and in Anambra State by Fakae et al; (1991). From the point of view of the range of species of helminthes parasites found in sheep in Liman katagum and Bununu, it is apparent that there is similarity between this locality and some states in Nigeria, particularly eastern states of Nigeria (Fatihu et al; 1991) and Plateau State. (Fabiyi, 1972). Species commonly distributed were *Haemonchus contortus* occurring 51.55% while the least distributed were *Oesphagostmun venulusum* with 02.48% occurrence .

### **infection in relation to Area**

From the present study, there is significant difference between the study areas. Out of 386 sheep examined, 184 were from Liman Katagum while remaining were from Bununu. Infection is higher in Liman katagum where 58 (31.52%) were infected but only 09 (04.89%) were infected in Bununu. Statistically,  $H_0$  is rejected, since the calculated value (43.814) is grater than tabulated valued (3.84). this variation is probably due to geographical location of a place which can be attributed to environment factors suitable for the productivity of this organisms.

### **Infection in Relation to season.**

Out of the 184 sheep 28 examined in wet season were positive where as in the dry season 39 sheep (21.16%) were positive. This showed that infection is higher in dry season than in wet season. This is in conformity with the work of Gana *et al.*, 2015 in the guinea Savannah zone of Nigeria and Taswar *et al.*, 2010 in Pakistan where it was reported that the parasite Haemonchosis has been more frequent in wet season (79.41%) than in dry (36.06%) as confirmed by Melelo *et al*; (1988) that parasites are found more in dry season than in wet season.

### **Infection in Relation to Sex:**

From the studies carried between male and female sheep there was no significant difference between them therefore  $H_0$  is accepted as the calculated value (1.84) less than the tabulated value (3.841) at 0.05 level: and  $H_0$  is accepted. This is because out of 368 sheep examined 214 (58.15%) sheep males and 34 (15.90%) of them are positive. 154 (41.85%) sheep were females and 33 (21.43%) were positive. It is not conformity with the work of coop; 1982 who reported that males are more susceptible to infection than females.

### **Infection in Relation to Age:**

A total of 368 sheep examined, 86 (23.37%) sheep age between 0 to 9 months of age and 21 (24.42%) were

positive and 282 (76.62%) between 10 to 20 months of age and 16.31% were positive. This is revealed that infection in young is higher than in adult sheep. Although there was no significant difference at  $P < 0.05$  statistically, however same trend has been observed by previous studies (Raza, et al., 2007., Taswar *et al.*, 2010 and Gana et al., 2015) that Younger animals are more susceptible and also the work of Devada and Sathianesan, (1988) who reported that adult animal become more resistance to helminthes parasites than young animals. However, in a contradiction to the findings of Attindehou *et al.*, (2012) where it was reported that infection was same across all ages and there was no any difference in rate of infection in relation to age.

## CONCLUSION

*Haemonchus contortus* is a nematode causes economic and production losses to the world sheep producers. It is one of the major causes of death of young animals (Stephen *et al*, 2003). There is manifestation of this nematode in Liman Katagum and Bununu Villages in Bauchi State, though it is mild.

The infection can be attributed to environmental factors ranges suitable for the productivity of these organisms.

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