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Helminthosis in Livestock Slaughtered in Dei-Dei Abattoir, F.C.T Abuja

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A survey of helminthes parasites associated with 1002 goats and sheep slaughtered at Dei-Dei abattoir was carried out between the months of September 2012 to March 2013. Six different parasites species were encountered with their prevalence namely, *Taenia* sp. (119; 11.88%), *Ascaris* sp. (118; 11.78%), Hookworm (179; 17.86%), *Trichostrogylus* (103; 10.28%), *Hymenlopsis* sp. (18; 1.80%) and *Trichiuris* sp. (15; 1.50%). A total of 552 animals (55.09%) infected. Out of the 552 positive cases 266 (48.19%) were sheep and 286 (51.81%) were goats and173 (31.34%) were male and 379 (68.66%) were females. There was no statistical significant relationship (P >0.05) between infection and type of animal slaughtered. However, there was significant statistical relationship (P <0.05) between infection and sex of animal slaughtered, with females having a higher infection rate than males. There was also significant statistical relationship (P <0.05) between infection and age of animal slaughtered. There was also significant statistical relationship (P <0.05) between infection and the month which the animals were slaughtered.

Keywords: Helminthosis, Livestock Slaughtered, Abattoir.

INTRODUCTION

Sheep and goats are domesticated animals raised to produce commodities such as food fiber and labor. Livestock and poultry production are the main economic activities of about 70% of Nigerians living in the rural and urban areas but there are several limiting factors to livestock production. These limiting factors include poor feeds, lack of grazing areas, disease, poor management practices and poor financial base. After feed, disease is the second most limiting factor in livestock production and the principal cause of low performance in the livestock sector. Economic loss due to diseases runs into millions of Naira with an estimated economic loss of about 12 million nairas ($100,000) in 1987. Livestock disease can compromise animal welfare, reduce productivity and can infect humans (Derner e*t al.* 2009). The importance of gastro-intestinal parasites as a major constraint to small ruminant health and production is well recognized world-wide, in Africa and Nigeria. The economic losses from worm parasites infection of cow, goat and sheep can be significant. In Nigeria the losses due to helminthosis was estimated at 14 million Naira annually, at atime in the 1970 and early 1980s when goats and sheep were sold at ₦6 and ₦4 per head respectively (Akusu and Ajala, 2000). There is therefore a need to obtain the current economic significance of the disease since the price of sheep and goats has now risen by 1000%. The study was aimed at surveying the various helminthes associated with sheep and goats slaughtered in Dei-Dei, Abuja and finding t he relationship of the

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prevalence of these intestinal parasites with age, sex and the month the animals were slaughtered.

MATERIALS AND METHOD

Study Area

The study was carried out in Dei-Dei (Bwari Area Council) of the Federal Capital Territory (F.C.T) Abuja. Dei-Dei houses the International Livestock Market and the international building materials market. Bwari Area Council is located between latitude $7^{o}23^{1}$ 0^{11} North of the Equator and Longitude $9^{0}17^{1}0^{11}$east with a vast land of 1100km^{2}. Bwari Area Council Is located at the North Eastern part of Federal Capital Territory (Balogun, 2001). The abattoir is located in the Dei-Dei International livestock market.

Study Population and Sample Collection

A total number of 1002 samples were examined, comprising 501 sheep and 501 goats of both sexes and different ages were examined for the presence of intestinal parasites between the months of September 2012 and March 2013. Aging of the livestock was carried out with the help of a veterinary doctor using their dentition. Specimens were collected from the animals using a sterile stool wide mouthed specimen bottle. The specimens were collected directly from the rectum. The specimen bottles were labeled clearly with animal identification, age, sex and date of collection. This was then placed in polythene bags kept at 5^{o}C in a container with ice block before being conveyed to the Microbiology Laboratory of National Institute for Pharmaceutical Research and Development (NIPRD), Idu, Abuja for analysis.

Sample Analysis

Formal-ether concentration technique (Cheesebrough, 1998) was used to analyze the fecal matter Collected. A gram of the stool sample was added to 10ml of 10% formalin in a 15ml test tube. A clean glass rod was used to stir until a suspension was formed. This was allowed to stand for 30 minutes for adequate fixation. The suspension obtained was then sieved into a centrifuge tube through two layers of cotton gauze in a funnel; 3-4 ml of diethyl ether was added to the supernatant. The tube was closed with a glass stopper and shaken well for 30 seconds. This was centrifuged at 3000rpm for 3minutes. Four layers were formed; A layer of diethyl ether on top, a layer of debris/fat below it, Then a layer of formalin and at the bottom (last layer) A layer of sediment. The tube was rapidly inverted the ether, debris/fat and formalin were discarded. Pasteur pipette was used to put the deposit on a clean grease free glass slide and a cover slip was placed. The slide was viewed under an x10 objective lens of a light microscope. This process was repeated until the whole sediment is viewed. Eggs of parasites were identified based on a Chart prepared by Soul by (1982).

Statistical Analysis

Statistical analysis was conducted using simple percentages and Chi-Square Test. Odds Ratio was calculated to test association between risk factors and infection. In all the analysis $P < 0.05$ was set for significance.

RESULTS

Six different parasites species were encountered with their prevalence namely, *Taenia*sp. (119; 11.88%), *Ascaris*sp. (118; 11.78%), Hookworm (179; 17.86%), *Trichostrogylus*(103; 10.28%), *Hymenlopsis*sp. (18; 1.80%)and *Trichiuris* sp. (15; 1.50%). A total of 552 animals (55.09%) infected. As shown on Table I, 606 were female and 396 were male. A total of 173 males (43.69 %)and 379 females (62.54%)were found to harbor helminthes parasites. There was significant relationship $P<0.05$ between infection and sex of animals slaughtered. There was, however, no association (Odds Ratio=0.46) between risk factor of animal slaughtered and infection.

Out of the 1002 animals examined, 501 were goats and 501 were sheep. As shown in Table II, 286 (57.09%) goats were infected and 266 (53.09%) sheep were infected. There was no significant relationship ($p>0.05$) between infection and type of animal slaughtered. There is slight association between infection and breed of livestock (Odds Ratio= 0.85).

The distribution of the animals according to the age groups showed that 98 were between the age group 0- 6 months and 31 (31.63%) were infected (Table III).A total of 130 animals were of age group 7-13 months with 73 (56.15 %)infected, 320 were of age group 14-20 months with 175 (54.69%)infected, 272 were of age group 21-27 months with 175(64.34%) and 182 were of age group 28-34 months with 98 (53.85%) infected. There was significant relationship $P<0.05$ between infection and age of animal slaughtered.

The samples were collected from September 2012 to March 2013. There was significant relation $P<0.05$ between infection and the month the animals were slaughtered. One hundred and thirty eight samples were collected in September and 144 for the subsequent months. Table IV showed that in September, out of the 138 samples collected 104 (75.36%) was infected. In October, 119(82.64%) were infected, In November 99(68.75%) were infected, in December 66(45.83%) were infected, in January 44 (30.56%) were infected, in February

Table I. Prevalence of Helminth Infections In Relation To Sex of The Animals Slaughtered

Type Of Parasite	Sex-Specific Rate Of Infection (%)		Total
	Male	Female	N=1002
	N=396	N=606	
Taeniasp	46 (11.62)	73 (12.05)	119 (11.88)
Hookworm	57 (14.39)	122 (20.13)	179 (17.86)
Trichostrogylus	27 (6.82)	76 (12.54)	103 (10.28)
Trichurissp	2 (0.51)	13 (2.15)	15 (1.50)
Ascarissp	36 (9.09)	82 (13.53)	118 (11.78)
Hymenlopsissp	5 (1.26)	13 (2.15)	18 (1.80)
Total	173 (43.69)	379 (62.54)	552 (55.09)

χ^2 =34.4119, Df=1. P<0.05 Odds Ratio=0.46

Table II. Prevalence Of Helminth Infections In Relation To The Type Of Animal Slaughtered

Type Of Parasite	Prevalence Rate Of Infection (%)		Total
	Sheep	Goat	N=1002
	N=501	N=501	
Taeniasp	60 (11.98)	59 (11.78)	119 (11.88)
Hookworm	85 (16.97)	94 (18.76)	179 (17.86)
Trichostrogylus	48 (9.58)	55 (10.98)	103 (10.28)
Trichurissp	3 (0.60)	12 (2.40)	15 (1.50)
Ascarissp	62 (12.38)	56 (11.18)	118 (11.78)
Hymenlopsissp	8 (1.60)	10 (2.00)	18 (1.80)
Total	266 (53.09)	286 (57.09)	552 (55.09)

χ^2=1.6134, Df=1. P>0.05 Odds Ratio=0.85

Table III. Prevalence of Helminth Infections In Relation To Age of The Animals Slaughtered

Type Of Parasite	Age-Specific Rate Of Infection (%)					Total
	0-6 Months N=98	7-13 Months N=130	14-20 Months N=320	21-27 Months N=272	28-34 Months N=182	N=1002
Taeniasp	4 (4.08)	18 (13.85)	43 (13.44)	34 (12.5)	20(10.99)	119(11.88)
Hookworm	9 (9.18)	15 (15.54)	59 (18.44)	60 (22.06)	36(19.78)	179(17.86)
Trichostrogylus	8 (8.16)	11 (8.46)	20 (6.25)	39 (14.34)	25(13.74)	103(10.28)
Trichurissp	0 (0)	3 (2.31)	5 (1.56)	7 (2.57)	0 (0)	15(1.50)
Ascarissp	10 (10.20)	17 (13.08)	41(12.81)	33 (12.13)	17(9.34)	118(11.78)
Hymenlopsissp	0 (0)	9 (6.92)	7 (2.19)	2 (0.74)	0 (0)	18(1.80)
Total	31 (31.63)	73 (56.15)	175(54.69)	175(64.34)	98(53.85)	552(55.09)

χ^2=31.3928,Df=4. P<0.05

40(27.78%) were infected and in March 80(55.56%) were infected.

DISCUSSION

Sheep and goat slaughtered at Dei-Dei abattoir were infected with a wide variety of parasite. A total of six helminthes parasites types were recovered. The total occurrence of such wide variety could be attributed to the fact that small pellet of sheep and goats dropping disintegrates rapidly, thus releasing worm larvae on to pasture and animals get infected with these parasites while feeding. This is similar to the findings of Fabiyi (1990) and Yohanna *et al.* (2012) who reported that cestodes and nematodes constituted the major cause of serious morbidity associated with young ruminants in both northern and western Nigeria. Most of these parasites are blood-sucker and their presence may cause anemia, retarded growth, emaciation and weakened stock. Heavy infestation can result in significant weight loss, reduced productivity, restlessness and increased susceptibility of animals to other diseases and death. According to Soulby (1982), the larvae of hookworm were associated with introduction of organism of 'foot rot' into the skin around the animals' feet.

Sex-specific rates of infection for all animal examined was significant, with females having more infection than males. This is similar to the findings of adoun (2012) and this contrasted the findings of Idris and Umar (2009) who reported that there was no significant relationship between infection and sex of goats. This is similar to the findings of Yohanna *et al.* (2012), that there is significant difference between infection of males and females. Higher level of infection in females may be due to the fact that a lot of the females slaughtered were nursing with even a pregnant goat slaughtered. This might have lowered the immunity of the females. According to Radostits *et al.* (2000) rate of acquire resistance is affected by species of the parasite and host, genetic factors, nutrition and physiological stress (such as Partition).

Table IV. Prevalence of Helminth Infections In Relation To Month Animal Was Slaughtered

Type of parasite	Month specific Rate of infection (%)							Total
	Sep N=138	Oct N=144	Nov N=144	Dec N=144	Jan N=144	Feb N=144	March N=144	N=1002
Taenia sp	21(15.22)	25(17.36)	22(15.28)	12(8.33)	10(6.94)	9(6.25)	20(13.89)	119(11.88)
Hookworm	28(20.29)	34(23.61)	31(21.53)	23(15.97)	17(11.81)	14(9.72)	32(22.22)	179(17.86)
Trichostrogylus	18(13.04)	24(16.67)	20(13.89)	10(6.94)	10(6.94)	9(6.25)	12(8.33)	103(10.28)
Trichuris sp	6(4.35)	4(2.78)	2(13.89)	0(0)	0(0)	0(0)	3(2.08)	15(1.50)
Ascaris sp	24(17.39)	27(18.75)	21(14.58)	19(13.19)	7(4.86)	8(5.56)	12(8.33)	118(11.78)
Hymenlopsis sp	7(5.7)	5(3.47)	3(2.08)	2(1.39)	0(0)	0(0)	1(0.69)	18(1.80)
Total	104(75.36)	119(82.64)	99(68.75)	66(45.83)	44(30.56)	40(27.78)	80(55.56)	552(55.09)

χ^2=179.5063, df=6. P<0.05

The rate of infection of parasites in the different type of animal was not significant this contrasted the findings of Bashir e*t al.* (2012) who found goat to be more infected than sheep with the helminthes. This could be explained by fact that most farmers in Nigeria raise sheep and goats together. As such, the animals move together in search of food and water and are both exposed to equal risk of infection.

Age specific rate of infection for all the animals examined was significant with age group 21-27 having the highest infection of 175 (64.34%). This is similar to the findings of Yohanna *et al.* (2012) who found that there is significant difference with infection with the different age group. This is similar to the findings of Bashir *et al.*(2012) who found significant difference with infection with the different age group but he however found younger age group to be more infected than the adults. This contrasted the findings of Bashir *et al.* (2012) who found that there was no significant difference with infection in goats. However, this is similar to the findings of Idris and Umar (2009) who found that there was significant difference with infection in the different age group in goats. Though all the age groups were infected, adults had the highest rate of infection. This could be due to the fact that a lot of the adult examined were nursing females. This could also be attributed to poor nutrition and type of management system of rearing livestock (semi-intensive; which is a poor management system which includes poor grazing practices) widely practiced by small holder farmer in Nigeria. This predisposes animals to physiological stress because they have to trek long distance for food and water. This might have lowered their immunity, therefore accounting for the high rate of intestinal parasites in adult. The lower rate of infection in age group 0-6 months could be due to the fact that most of them were yet to be weaned, thus were generally much less exposed to infection as they have not yet started grazing with the adults. The low infection rate could also be due to acquired immunity from their mother's milk.

The month specific rate of infection was significant with September and October being the most prevalent months. This is similar to the findings of Yohanna *et al.* (2012), who found significant difference with infection with the different months. This could be due to the fact that pasture infectivity is said to be negligible during the dry season since environmental conditions were unsuitable for larval migration. In the major livestock areas of northern Nigeria, rainfall is highly seasonal (charity 2009) there is a sharp division between the rainy season which last from March-October and the dry season which last from November-may.

Small-holders may not easily detect the effects of internal parasites on their animals, because of the generally sub-clinical or chronic nature of the helminthes infections (Urquhart e*t al*., 1990). Thus, the sub-clinical parasitic infections are responsible for significant economic loss, because once clinical disease is noticed in a group of animals much economic loss in terms of animal productivity has already occurred (Urquhart e*t al*., 1990). Thus, a survey of abattoirs is an excellent means of knowing the prevalent ruminant disease so as to control these diseases.

CONCLUSION

This study indicates that sheep and goats slaughtered at Dei-Dei abattoir harbor a wide variety of intestinal helminthes parasites. The occurrence of these parasites indicates potential menace of clinical manifestation when conditions are favorable such as a combination of warmth and adequate moisture, more especially if animals are crowded in unhygienic conditions. There could still be improvement in the health care of animals if animal rearers have sound knowledge of infections, treatment and control measures incorporated with effective management techniques.

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