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Endoparasites of Bucks Raised under Intensive and Semi-Intensive System

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Abstract

An investigation was carried out on bucks in intensive and semi-intensive systems of management. A total of sixteen (16) bucks (male goats) were randomly purchased for the study. The animals were divided into four groups of four animals per treatment and fed *Panicum maximum*, *Gliricidia sepium* for Treatment 1 while Treatment 2 were fed *Panicum maximum*, *Gliricidia sepium* plus concentrates. Those in T3 were fed concentrate and allowed to graze and T4 were fed Panicum maximum and were also allowed to forage. The result showed significant difference ($P<0.05$) in infestations of strongyles amongst the treatments. The study has showcased some endoparasites of bucks in two different system of management. It is therefore advised that no matter the system of management employed routine treatment against parasite should not be neglected.

Keywords: endoparasites; goats; floatation; deworming.

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1. Introduction

Goats are small ruminants kept primarily for meat, milk, skin and in some region, for wools.

According to a 1961 FAO report, there were about 316 million goats in the world of which about 181 million were said to be found in the tropics or the sub-tropical regions of the world. In the last decade, [17] estimated the world goat population to be around 674 million, where about 94% are found in the developing countries. Africa and Asia account for about 81% of goat population as most of these developing countries are found within the two continent.

Reference [12] reported that the largest concentration of goats' population found in Africa is stationed in Nigeria, Ethiopia, Sudan and Samolia. Within the last seven years, the recent FAO Statistics [15] puts the number of goats in the world at 861.9 million with 53.8million goats in Nigeria alone. This represents 6.24% of the total goat population in the world [15].

This is an indication that goats play a major role in the Nigerian meat industry. The existence of goats in Nigeria and other parts Africa can be attributed to the facts that goats can thrive in conditions that may be difficult for other livestock species. Goats has the ability to forage and browse on a wide range and variety of vegetation, with their ability to like any kind of edible materials as well as their hardiness which contribute to their ability to survive the extremes of a tropical climate. Goats have proved their usefulness to man throughout the ages due to their productivity, small size and non-competitiveness with man for food.

It is important to note that goats play a significant role with valuable contributions to the poor rural dwellers in developing countries. Goat production creates employment opportunities at house-hold level and as well increase the house-hold income [29].

In Nigeria, it is reported that about 3-5 goat are kept per house-hold in the Southern part of Nigeria while those in the Northern region may keep up to 10 goats per house-hold [2].

According to [37], Nigeria hosts the largest West African Dwarf goat population in the West African Sub-region with approximately 11 million animals in the humid zone of Eastern Nigeria alone. Goats as small ruminants have some advantages over larger livestock such as cattle, because they are cheap, highly fecund, easily domesticated etc. [13].

However, as lucrative as a goat farming business maybe, there are factors influencing goat production in Nigeria such as, parasitism, infections and malnutrition [38]. Ademosun [3] and [22] attributed reduced productivity of small ruminants to infectious and parasitic diseases. A greater number of parasitic diseases play a detrimental role in hindering small ruminant production, resulting in serious economic loss [40].

Various reports from all around the world indicates that gastrointestinal helminthes is directly related with great economic losses recorded by farmers throughout the World. The losses are seen through morbidity in acute cases and in chronic cases, reduced meat and milk production [34,24,7,30,31,25] and increased mortality [36].

Reference [39] in citing [35,32,9] agreed that the loss through reduced productivity is related to reduction of food intake, stunted growth, reduced work capacity, cost of treatments and control of helminthosis.

Nematodes, cestodes and trematodes are responsible for helminth infections of ruminants [43]. It is on record that within the West African Sub-region, the prevalent gastrointestinal parasites are of the same *genera* and species. For example, [37] cited reports from the following countries to support this fact: from Ghana, [5]; from Mali, [41]; from Nigeria, [10] and from Sierra Leon [4]. Where the goats are raised in traditional, small-scale, mostly extensive system, little or no attention is given to worm control measures leading to low level chronic infections with 80-100% prevalence mostly during the rainy seasons [11,18]. These are the many factors that contribute the hindering of small ruminants production and growth of the sector.

1.1 objectives

The objective of this study was to investigate the parasite burdens in bucks raised in intensive and semi intensive systems of management.

2. Materials and Methods

2.1 study site

The study was conducted at the University of Uyo research farm, Uyo .Uyo is the capital city of Akwa Ibom State, in the South-South region of the Niger Delta, Nigeria. Uyo is 42sqmi 115 km2. The city population is 436,606. The straight distance between Uyo and Abuja is 272miles about 450 Kilometers [44].

2.2 experimental animals

Sixteen bucks aged between six months and years were purchased from house-holds within Uyo Metropolis. All of the aforesaid bucks were healthy; they were vaccinated against Peste des Petits Ruminant (PPR), with a local vaccine manufactured by the National Veterinary Research Institute (NVRI), Vom, Plateau State. PPR is a prevalent viral disease that affects ruminants. The bucks were also treated with dewormers so as to free them of possible worm infestation they may have come with.

The sixteen bucks were divided into four groups labeled T1, T2, T3 and T4 accordingly. Bucks in Treatments 1&2 were placed under the intensive system of management. Those in T1 were assigned *Gliricidia sepium* and *Panicum maximum* while those in T2 were fed *Gliricidia sepium*, *Panicum maximum* and concentrate on daily basis.

Those in Treatments 3&4 were placed on a semi-intensive system. Those in T3 were allowed to graze freely and fed concentrate when they return while those in T4 were also given freedom to graze but fed forages on their return.

The table below shows the chemical composition of some of the experimental diets

Table 1: showing proximate composition of *Gliricidia sepium, Panicum maximum*, cassava sievate and maize sieviate fed to the bucks during the period of the study.

COMPONENTS	**G.sepium**	**P. maximum**	**Cassava sievate**	**Maize sievates**	**SEM**
Dry matter	23.31	26.47	77.75	39.62	12.30
Crude protein	20.13	13.03	5.69	15.20	1.50
Ether extract	5.98	6.10	0.44	2.46	1.39
Ash	3.00	4.20	2.00	5.00	0.33
Crude fibre	3.63	27.40	0.76	4.88	6.14
Nitrogen free extract	42.95	22.80	13.36	32.84	6.38

2.3 faecal sample collection

Fecal samples were aseptically collected directly from the animals' rectum in the early hours of the morning using a sterile spatula twice per week throughout the period of the study. The samples were put into a sample bottles and labeled and later transported safely to the laboratory for analysis.

2.4 floatation test

This was done by placing a small amount of the feces about 2g into a test-tube and the adding the brime floatation solution to it. The mixture were mixed thoroughly, then filtered through a gauze into another test-tube, the filtrate were covered and allowed to stand for about 10minutes and then examined under a microscope after placement and mounting the slide [42,21]. The technique described by [27] was adopted to detect Trematodes, Nematodes and Coccidian oocyst in the sample.

2.5 direct smear technique

This involved mixing a very small fecal sample with tap water and then placing the mixture on a slide which was overlaid with a cover slide before examining it under a microscope. The smears were examined using X10 magnification for parasite eggs and X40 magnification for protozoa organisms. The identification of the different parasite egg was identified by their morphology and their sizes as described by [38]; [19].

2.6 data analysis

At the end of the study, data generated were subjected to various forms of data analysis such Microsoft excel, Chi test at $P<0.05$ level of significance.

3. Results and Discussions

Table II shows the results of the prevalence of the helminthes as revealed by the two methods of adopted for the identification of the worms. For bucks under the intensive system, using the direct smear method, we recorded 25% and 75% prevalence of parasites for T1 and T2 respectively while Treatment 3 and 4 those on semi-intensive system recorded 50% and 25% infestation rates respectively.

The floatation method revealed 100% infestation rate in T2 while the results for T1, T3, T4, were similar, 25%. This is an indication that the floatation method is more accurate. There was a significant difference among the means at ($p<0.05$) level of significance.

Table 2: Prevalence of Endo-parasites in Bucks using the floatation and the Direct Smear.

Methods	T1	T2	T3	T4	SEM
Direct Smear	25%	75%	50%	25%	10.36
Floatation	25%	100%	25%	25%	16.23

Table 3: Parasites identified in the study

	T1	T2	T3	T4	SEM
Strongyles	25.0^{b}	50.0^{a}	25.0^{bc}	0.00	8.83
Tapeworm	0.00	12.5^{c}	0.00	0.00	2.71
Coccidian	37.5^{b}	0.00	37.5^{b}	12.50	8.11
Ascaris	0.00	0.00	0.00	0.00	0.00

Means with different superscripts differs significantly (<0.05)

The two methods of examination employed in the study revealed that Strongyles specie were the most prevalent worm in the study followed by the tapeworm species. However the study did not record any infection from Ascaris across the treatment. This could be due to the reason that the Ascaris are transmitted through the feces into the mouth in humans. In livestock, Ascaris is transmitted through the contamination of the feedstuff and drinking water with fecal matter. The non-presence of Ascaris might be due to the antihelmintic administered earlier given before the commencement of the study. The high prevalence of strongyle eggs in the study is in line with Zeryehun, 2012, as well as reports by [1,26] in Ethiopian region. Reference [23] reported that *strongyle* species are responsible gastroenteritis, stunted growth and heavy mortalities in small ruminants.

The result presented in table III showed that there was low prevalence of tapeworm infection. This may be due to the fact that Tapeworms are not relatively pathogenic although heavy infestation may result in mild unthriftiness and digestive disturbances. Although this study did not identify the species of the tapeworm. But most reports identifies *Monienza spp* as member of the genera Cestodes that affects ruminants. In a similar study

conducted on slaughtered goats in the same region where the present study was conducted, the said study involve 250 goats out of which about 122 tested positive for one or more genera of helminth [33].

Coccidian oocyst in the study was similar across treatment and management system. Coccidian infections are usually associated with wet floors and rainy season as stated by [8].

Parasitic infections are due to poor host immunity as a result of malnutrition as well as certain factors of the climate such the temperature and humidity which promotes parasitic growth, development and multiplication as agreed by [38,20].

The presence of endoparasites in both the intensive and semi-intensive systems is in agreement with [6].

4. Conclusions

The information provided by this study may be considered useful as it provides insights into the parasitic diseases of goats in the area. It is worthy to note here that both the intensive and the semi-intensive system of goat rearing expose livestock to parasitism. Therefore, farmers should ensure that routine deworming is adopted without bias as this will reduce their losses due to endoparasitic infection. It is recommended that more research be carried out in the different *genera* and species of parasites parasitizing goats and other ruminants in the area.

This study may also serve as a guide to farmers, research student, government and other stakeholders in the livestock industry especially those concerned with goat production when formulating their policies in this regard. This is especially so in West Africa with regards to the West African Dwarf goats in particular which is almost facing extinction because of similar challenges.

References

[1] Abebe, W., Esayas, G. (2001). Survey on Ovine and Caprine Gastrointestinal Helminthosis in eastern part of Ethiopia during the Season of the year. *Revue', vet. Med., 152 (5): 379-384.*

[2] Adegbola, T. A., 1982. The Feeding and Nutrition of Small Ruminants. Proceedings 2nd nutritional workshop on small ruminants' disease and production. University of Nigeria Nsukka; pp: 20-21.

[3] Ademosun, A. A. (1992). Constraint and Prospects for Small Ruminant Research and Development in Africa. *Small rum. Dev. Afr., pp;1-5.*

[4] Asanji, M. F., Williams, M. O. 1987. A Qualitative and Quantitative Summary of Seasonal Dynamics of Gastrointestinal Parasites Livestock in Sierra Leon. *Bulletin of Animal Health and Production in Africa, 35, 191-200.*

[5] Assoku R. K. G. 1980. Studies on Parasitic Helminthes of Sheep and Goats in Ghana. *Bulletin of Animal Health and Production in Africa, 29, 1-10*.

[6] Al-Hebaatty, I. A. A. (2002). The Role of Some Vegetables in Gastric Parasites Transmitting to Human in Mosul City/Iraq. *Journal of Iraqi Agricultural Science 3(3): pp 132-138.*

[7] Beriajaya, D., Estuningsh, E. S., Darmono, M. R., Knox, M., Stoltz, D. R. and Wilson, A. J. (1995). The Use of Wormala in controlling gastrointestinal Nematode Infection in Sheep under Traditional Grazing Management. *Indonesia journal Hmu Termak dan Veterineer. 13: 49-55.*

[8] Blood, D. C. and J. A. Henderson, (1983). Veterinary Medicine Text Book of the Disease of Cattle, Sheep, Pigs, Goats and Horse, 6th edition. Bialliere Tindal, London.

[9] Chaudhary F. R., Khan, M. F. U., Qayyum, M. (2007). Prevalence of *Haemonchus contortus* in naturally Infected Small Ruminants Grazing in the Photohar Area of Pakistan. *Pakistan Vet. J., 27(2): 73-79.*

[10] Chiejina S.N. 1986. The Epizootiology and Control of Parasitic Gastroenteritis of Domesticated Ruminants in Nigeria. Helminthological Abstract Series A, 55, 413-429.

[11] Chiejina, S. N. 2001. The Epidemiology of Helminth Infections of Domesticated Animals in the Tropics with Emphasis on *Faciolosis* and Parasitic Gastroenteritis in Perspectives Helminthology, Chowdhurry N, Tada I, Editors. Science publishers Inc. Plymouth, UK, pp.41-87.

[12] Devendra, C. (1996). Goats: Challenges for Increased Productivity and Improved Livelihoods. Outlook on Agriculture. Vol. 28, No. 4. 215-296.

[13] Edosomwin, E. U. and Shoyemi, O. O. Prevalence of Gastrointestinal Helminthes Parasites of Cattle and Goats Slaughtered at Abattoirs in Benin City, Nigeria. *African Scientist Vol. 13, No.2, 2012.*

[14] F.A.O., (1961). Production Year Book, 16, Rome; FAO.

[15] F.A.O. (2008). Production Year Book. Rome; FAO

[16] F.A.O., Production Year Book, Vol. 50. Food and Agricultural Organization. Rome. 1996

[17] F.A.O., 2005. www.en.m.wikipedia.org/wiki/goat.

[18] Fakae, B. B. 1990. The Epidemiology of Helminthosis in Small Ruminants under the Traditional Husbandry System in Eastern Nigeria. *Veterinary research communications, 14, 381-391.*

[19] Foriet, N. 1999. In: *Reference Manual of Veterinary Parasitology*. 5th (Ed). *Wiley Blockweil,* New York, USA, pp: 22-26.

[20] Gadahi, J. A., Arshed, M. J., Ali, Q., Javaid, S. B and Shah, S. J. (2009). Prevalence of Gastrointestinal Parasites of Sheep and Goats in and around Rawalpindi and Islamabad, Pakistan. *Pakistan Veterinary World*, Vol.2 (2):51-53.

[21] Hansen, J., Perry, B. (1994). The Epidemiology, Diagnosis and Control of Helminthes Parasites of Ruminants. 2nd Edition Nairobi, Kenya; ILRAD.

[22] Heilelul, N. (2002). Study on Prevalence of GIT Helminthes of Small Ruminants in and around Wolayta Soddo, Southern Ethiopia. DVM Thesis, Faculty of Veterinary Medicine, Addis Ababa University, Debre-zeits. Ethiopia. pp: 352.

[23] Kagira, J. M., Kamyari, P. W. N. 2001. The Role of Parasites Diseases in Causing Mortalities in Small Ruminants in Highly Productive Areas of Central Province, Kenya. *Journal of South African veterinary Association. 72: 147-149.*

[24] Karki, N. P.S. (1987). Sheep Resources in Nepal and Some Constraint in Migratory System of Production. Paper Presented at the 2nd Conference of the Nepal Veterinary Association. 23-25. February.1987.

[25] Kusiluka, L. J. M., Kambarage, D. M., Mathewman, R.W., Harrison, L. J. S., Daborn, C. J. 1994. Epidemiology of Gastrointestinal Helminthes in Goats under Different Systems of Management in Morogoro District. *Tanzanian Veterinary Journal 14: 3-4.*

[26] Kumsa B, Tadesse T, Sori T, Dugum R, Hussen B. (2011). Helminth of Sheep and Goats in Central Oronia (Ethiopia) during the Dry Season. *J. Anim. Vet. Adv., 10(14): 1845-1849.*

[27] MAFF. 1986. Ministry of Agriculture, Fisheries and Food (MAFF). Manual of Vet. Parasitological Laboratory Techniques. 3rd edition, Reference Book 418. HMSO, London.

[28] Mahmoud, A. A. Present Status of the World Goat Populations and their Productivity. *Lohman information. Vol. 45(2) 2010. Pp: 42-52.*

[29] Mhoma, J. R. l., Kanyari, P. W. N, and kayira, J.M. (2011). The Prevalence of Gastrointestinal Parasites in Goats in Urban and Peri-urban areas of Nwanza City; Tanzania. *Sci. parasitol. 12 (4): 191-196*.

[30] Nansen, P. 1991. Research Collaboration on Gastrointestinal Parasites. In: "Inaugural Seminar of DANIDA Funded Ruminant Gastrointestinal Helminthes Research Project". Conducted at Sokoine University of Agriculture, Morogoro, Tanzania, December 9-13, 1991, pp; 1-2. National Bureau of Statistics, Republic of Tanzania, 2007.

[31] Ngomuo A. J., Gyrd-Hansen, N. 1986. Helminthes and antihelminthics in livestock production. A review. Proceedings of the 4th Tanzanian Veterinary Association Scientific conference, Arush, pp; 99-114.

[32] Odoi. A., Gathuma, J. M., Gachuiri, C. K., Omore, A. (2007) risk factors of gastrointestinal nematode parasite infections in small ruminants kept in small holder Mixed farms in Kenya. BMC. *Vet. Res, 3(6): 1186-1746*.

[33] Offiong, E. E. A., Habib, M., Williams, M., Eyoh, G. D. and Obioku, E.O. Helminthes Parasites Found in Goats Slaughtered for Meat in Etim Ekpo Local Government Area of Akwa Ibom State. Nigeria. *Bulletin of Anim. Hlth. prod. Afri. (2013), 61, 657-661*.

[34] Ogunrinade, A. F. (1984). IgA Reponse in Natural and Experimental Infections of Cattle with *Faciola gigantica* in West Africa Dwarf Sheep and Goats. *Tropical Animal Health Production. 16(3): 161-166.*

[35] Pedreira, J., Silva, A. P., Andrade, R. S., Suarez, J. L., Arias, M., Lomba, C., Diaz, P., Lopez C, Banos, P. D., Morrondo, P. 2006. Prevalence of Gastrointestinal Parasites in Sheep and Parasites Control Practices in North-West Spain. *Prev. Vet. Med., 75:56-62*.

[36] Perry, B.D., Randolph, T. F., McDermott, J. J., Sones, K. R., Thornton, P. K. (2002). Investing in Animal Health Research to alleviate Poverty. *International livestock Research Institute (ILRI), Nairobi, Kenya, pp; 148.*

[37] Chiejina, S. N., Behnke, J. M. and Fakae, B. B. Haemonchotolerance in West African Dwarf Goats. Contribution to sustainable Anthelmintics-free Helminthes Control in traditionally managed Nigeria dwarf goats. Parasites. (2015), 22, 7.

[38] Soulsby, E. J. L. 1982. Helminthes, Arthropods, Protozoa of Domesticated Animals. 7th Edition. Baillere Tindal, londond. Pp: 213-316.

[39] Tefaheywet Zeryehum. Helminthosis of Sheep and Goats in and Around Haramaya, Southeastern Ethiopia. *Journal of Veterinary Medicine and Animal Health. Vol.4 (3). Pp; 48-55.2012.* http://www.academicjournals.org/JVMAH.

[40] Teklye B. (1991). Epidemiology of endoparasites of small ruminants in sub-saharan Africa. Proceedings of fourth National livestock improvement conference. Addis Ababa, Ethiopia, pp: 13-15.

[41] Tembely, S., Galvin, T. J., Koyote, S. B., Bangali, K, Berkmoes, W. 1992. Gastrointestinal parasites of small ruminants in Mali: geographical distribution, epidemiology and chemotherapy, In: Proceedings of the First Biennial Conference of the Africa Research Network, 10-14. December, Ray B, Lebbie SHB. Reynolds. L, Editors. Nairobi, Kenya ILRAD.

[42] Urqhart, G. M., Armour, J., Duncon, J. L., Dunn, A. M., and Jennings, F. W. 1987. Veterinary Parasitology. Longman group. UK Ltd. England. Pp: 19 and 276-277.

[43] Zahid, I. A., Latif, M. and Baloch, K.B., 2005. Incidence of Endoparasites in Exotic Cattle Calves. *Pakistan Veterinary Journal. 25(1):47-48*.

[44] http://thegpscoordinates.net/nigeria/uyo.