

**Occurrence on intestinal parasites in rabbits (*Oryctolagus cuniculus*)
reared in Nsukka area of Enugu State, Nigeria**

Polycarp O. Akpa* and Cornelius C. Chukwu

Department of Veterinary Medicine, Faculty of Veterinary Medicine, University of Nigeria, Nsukka,
Enugu State, Nigeria.

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Abstract

The occurrence of intestinal parasites in rabbits reared in Nsukka area of Enugu State, Nigeria was evaluated. The study design was a cross sectional survey. The areas in which the rabbitries surveyed were located included Obukpa, Odenigbo, Orba, Nsukka Town and University of Nigeria Nsukka (UNN) Staff Quarters. Faecal samples were collected from a total of 150 rabbits in the study area for the study. Salt floatation technique was used to examine the faecal samples for helminth ova and coccidia oocysts. Data on the occurrence of parasites in the faecal samples were subjected to descriptive and Chi square statistics. Results showed that none of the faecal samples had helminth ova/eggs, but 80.7% of the faecal samples (121 out of 150 samples) had *Eimeria* oocysts. The percentage occurrence of *Eimeria* oocysts in faecal samples collected from the specific areas of Nsukka studied were: 75% in Obukpa, 80% each in Odenigbo and Orba, 76% in Nsukka Town and 85% in the UNN Staff Quarters. There was no significant difference ($p > 0.05$) in the occurrence of *Eimeria* oocysts in the faecal samples of rabbits from the specific areas from which samples were collected. The results of the study suggest that infection with *Eimeria* species may be a significant health issue in rabbits, and should be of concern to rabbit farmers in the Nsukka area of Enugu State, Nigeria. It is therefore recommended that attention should be focused on the control of intestinal coccidiosis of rabbits in the study area.

Keywords: Intestinal parasites; Helminths, *Eimeria* species; Rabbits; Occurrence; Nsukka Nigeria.

***Correspondence:** Polycarp O. Akpa; Email: polycarp.akpa@unn.edu.ng Phone: +2348033506623

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Introduction

Rabbits are mammals that belong to the family *Leporidae* of the order *Lagomorpha*, and they are reared in many parts of the world, including Nigeria (Rewatkar *et al.*, 2013). The domestic rearing of rabbits is becoming popular in the south eastern part of Nigeria, and specifically in the Nsukka area of Enugu State, Nigeria. The popularity of rabbit production in Nsukka area is probably due to the fact that the meat is widely acceptable and has been renowned for having low cholesterol levels. It was reported in 2006 that about a million fresh, chilled/frozen meat and edible offals of hares and rabbits was exported from Nigeria (NBS, 2006). Apart from rabbit meat, rabbit pelts (skin) can be used for making jackets, headgear, carpet or rugs and other decorative household ornamentals (Emedo, 1989). Rabbits are also extensively used by researchers in the safety/toxicity evaluation of different therapeutic agents, foods, chemicals and in a broad variety of biological investigations, for the diagnosis of infectious diseases, production of vaccines, sera and other biological substances of public health and medical importance (Bugti *et al.*, 2016; Ola-Fadusin *et al.*, 2018).

There are variations in the husbandry and management system of rabbits. They (rabbits) can be kept in small units of two to four does and a buck, as a backyard rabbitry, and the stock could be built up very rapidly because they are very prolific and the litter size may be as high as 12 (Mailafia *et al.*, 2010; Bugti *et al.*, 2016). There are also intensive husbandry management methods of keeping rabbits that involve the construction of hutches. The hutches are constructed in single, double or even 3-tier units, separated by metal dropping trays. The floors of the hutches are usually made of 1.5 cm wire mesh which allows the faeces and urine to drop to the ground (Bugti *et al.*, 2016). The intensive husbandry management minimizes faecal contamination of the rabbit feed and thus maintenance and

survival of parasites (worm ova/*Eimeria* oocyst) in the hutch (Flynn, 1973). The small holder backyard management method is commonly associated with faecal contamination of the feed of the rabbits which will in turn encourage better survival and maintenance of intestinal parasites (Mbutu, 2013).

The commonest reported parasites of rabbits include helminths, coccidia, fleas and mange (Akpo *et al.*, 2012; Ola-Fadusin *et al.*, 2018). Diseases and disorders caused by parasites account for significant loss in production and profit in rabbitries, and are commonly responsible for a reasonable percentage of requests for veterinary attention by rabbit keepers (Ola-Fadusin *et al.*, 2018). The occurrence of parasites in rabbits has been reported in some parts of Nigeria (Biu and Nwosu, 1998; Musungong and Fakae, 1999; Dogo *et al.*, 2017), but there is no information in available literature on the occurrence of intestinal parasites in rabbits in Nsukka area of Enugu State, Nigeria. Hence this present study, which evaluated the occurrence of intestinal parasites in rabbits reared in the Nsukka area of Enugu State, Nigeria.

Materials and Methods

The study design was a cross-sectional survey. The study area was Nsukka in Enugu State, Nigeria. Nsukka is a suburb in the derived savannah zone of Eastern Nigeria, located within latitudes 6° 52'N and 6° 58'N and longitudes 7° 20'E and 7° 27' E (Ugwuanyi *et al.*, 2005). For the sake of the study, Nsukka area was sub-divided into five sections: Obukpa, Odenigbo, Orba, Nsukka town and University of Nigeria Nsukka (UNN) Staff Quarters. The study was carried out between the months of March and July.

A total of 150 faecal samples were collected for the study. The number of samples collected from each specific area of Nsukka is outlined in Table 1. The faecal samples were

collected fresh from the rabbitries in clean containers that were carefully labeled. Since collection of the droppings per rectum, was not feasible because of the narrowness of the rabbit rectum, freshly voided faeces were collected. This was achieved by visiting each location twice in a day: firstly in the morning to clear the droppings voided the previous day, and at mid-day, the second visit was made to collect the droppings voided in the dropping trays within the morning period. These samples were brought to the laboratory and examined for parasite eggs, using salt floatation method as described by Cock (1969), briefly described as follows: Two grams of the faeces was weighed out. It was then transferred to into a wide mouthed beaker and 30 ml of water was added. This dissolved all the faeces. The content of the beaker was then stirred and poured through a coffee sieve. This was then distributed into two 15 ml centrifuge tube and centrifuged for 2 minutes at 1,500 rpm. The supernatant was discarded, and sodium chloride solution was added up to a limit of about 1 cm from the top. The thumb was placed on top of the tube and slackened. The test tube was then filled with the help of a dropping pipette to form a positive meniscus. A 22 × 22 mm cover slip was placed over the tube and then re-introduced into the

centrifuge and centrifuged for 3 minutes at 1,500 rpm. The cover slip was then placed on a clean slide and viewed under the microscope for parasite egg/oocyst identifications (El-Shahawi *et al.*, 2012).

The rabbits were humanely handled all through the study, and the relevant welfare and ethical guidelines for the use of animals for research were followed during the study.

Data obtained were subjected to descriptive and Chi square statistics, using IBM SPSS software version 20. Significance was accepted at $p < 0.05$.

Results

Out of the 150 rabbits screened, none was positive for helminth ova. One hundred and twenty one out of the 150 samples screened (80.7%) had coccidia oocysts in their faecal sample. The percentage occurrence of coccidia oocysts across the specific sub-areas in Nsukka were: Obukpa – 75%, Odenigbo – 80%, Orba – 80%, Nsukka Town – 76%, and UNN Staff Quarters – 85% (Table 1). There was no significant difference ($p > 0.05$) in the occurrence of coccidia oocysts in the specific sub-areas of Nsukka.

Table 1: Distribution of the rabbits sampled and occurrence of intestinal parasites in rabbits in Nsukka area, Enugu State, Nigeria.

Specific area in Nsukka from which faecal samples were collected	Number of rabbits from which samples were collected in the area	Number of samples with <i>Eimeria</i> oocyst (percentage in parenthesis)	Number of samples with helminth eggs (percentage in parenthesis)
Obukpa	20	15 (75%)	0 (0%)
Odenigbo	20	16 (80%)	0 (%)
Orba	25	20 (80%)	0 (0%)
Nsukka town	25	19 (76%)	0 (0%)
University of Nigeria Nsukka Staff Quarters	60	51 (85%)	0 (0%)
Total	150	121 (80.7%)	0 (0%)

Discussion and Conclusion

It was surprising to observe that out of 150 rabbits screened for intestinal parasites, none was positive for helminth parasites, but 80.7% had *Eimeria* oocysts. Many helminth parasites are known to occur in rabbits in the tropics (Whitney, 1979). However none was recorded in rabbits screened at Nsukka. This observation becomes more interesting when one realizes that the screening was done during the early rainy season (March – July), when there should be optimum conditions for the development and survival of the pre-parasitic stages of the nematodes (Dinarburg, 1944), and which will enhance transmission and infestations. The probable reason for this apparently no occurrence of helminth eggs in the faecal samples of the rabbits screened could be that of management. All the rabbits screened were reared intensively; they were all housed in cages and they were zero-grazed. The finding of 0% occurrence of helminth eggs in faeces of the rabbits screened is in contrast to the reports of Ola-Fadunsin *et al.* (2018) of 28.38% occurrence of helminthoses in rabbits in Osun State, Nigeria.

The high (80.7%) occurrence of *Eimeria* oocysts in the rabbits screened may not be unconnected with the management and husbandry practices in the rabbitries from which the faecal samples were collected. During the screening, it was observed that most of the hutches did not have an in-built wire mesh for the floor which should have minimized faecal contamination of the feeds. Rather the floors were solid and there was high faecal contamination of the feeds and high level of moisture in the hutches. It was believed that this perpetuated oocysts in the hutches and re-infection of the rabbits. The 80.7% occurrence of coccidia oocysts recorded in this study is close to the 78.6% reported by Ola-Fadunsin *et al.* (2019) in rabbits in Ilorin Nigeria, but was higher than the 66.7% reported by Dogo *et al.* (2017) for rabbits in Vom, Plateau State, Nigeria. It is also higher

than the 37.4% occurrence of hepatic coccidiosis due to *Eimeria stiedai* in rabbits in Nsukka Local Government area of Enugu State, Nigeria. Ola-Fadunsin *et al.* (2018) also reported a relatively low 13.51% occurrence of coccidiosis in a retrospective study of parasitic diseases of rabbits in Osun State, Nigeria.

The lack of significant difference in the percentage occurrence of coccidian oocysts in the different sections of Nsukka area is thought to be due to the fact that all the locations are within the same ecological zone and the management/husbandry practices are nearly the same all through the whole of Nsukka area.

It was concluded that the occurrence of coccidia oocysts and helminth eggs in rabbits reared in Nsukka area were 80.7% and 0%, respectively. This suggests that infection with *Eimeria* species may constitute a significant health issue in rabbits in Nsukka, and that reasonable attention should be paid to the control of coccidiosis of rabbits in the study area.

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Conflict of Interest

The authors declare no conflict of interest.

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