



Prevalence of Haemoparasites in Chickens Slaughtered at a Live Bird Market in Samaru Zaria, Nigeria

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ABSTRACT

This study was carried out to determine the prevalence of haemoparasites in chickens (*Gallus gallus domesticus*) slaughtered at the Samaru Live Bird market of Sabon Gari Local Government Area of Kaduna State, Nigeria. A total of 100 blood samples were collected from male and female chickens at the point of slaughter. The samples were collected in heparinized sample bottles and transported to the Veterinary Protozoology Laboratory of the Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria Nigeria for analysis. Out of the 100 chickens sampled, 51% were males while the remaining 49% were females. Microscopic examination of the Giemsa-stained thin blood smear revealed an overall prevalence of haemoparasites to be 81%. Forty-nine (49%) percent of these were plasmodium species, while 27%, 21% and 3% of the haemoparasites detected were *Aegyptianella*, *Haemoproteus* and *Leucocytozoon* species respectively. With respect to sex, the prevalence was higher in cocks (55%) than in hens (45%). More studies are needed to evaluate the prevalence of haemoparasites of chickens in different seasons of the year with the view of providing information that will enhance productivity in the poultry industry.

Keywords: Chickens; Haemoparasites; Prevalence; Zaria-Nigeria

INTRODUCTION

In Nigeria, poultry production involves raising chickens, ducks, guinea fowls, pigeons, turkeys and ostriches (Opara *et al.*, 2012). Of these poultry species, chickens are the most extensively reared, and more profitable to farmers. The poultry industry supplies meat and eggs, which is vital to the national economy as a source of revenue for the farmers (Obioha, 1992). It improves the nutritional status and income of many small-scale farmers, especially in developing countries (FAO, 1987; Creevey, 1991). Despite the importance of chickens in the livelihood of humans, reports have shown that parasitism ranks high among the factors that threaten the production of chickens (Mapiye *et al.*, 2008; Nnadi and George, 2010; Lawal *et al.*, 2016). Avian haemoparasites are pathogenic to their hosts and are responsible for causing high mortalities and reduced productivity in infected flocks (Merino *et al.*, 2000).

Although poultry production using intensive management system is becoming more popular, the prevalence of haemoparasites, their effects on health and productivity of chickens in Samaru Zaria have not been adequately studied. This study seeks to provide some information on the prevalence of haemoparasites in chickens with a view to providing solutions for poultry farmers

The study will determine the prevalence and types of haemoparasites in chickens slaughtered at the Samaru Live Bird Market of Sabon Gari Local Government Area of Kaduna State, Nigeria.

MATERIALS AND METHODS

Study Area

The study was conducted at the live bird market of Samaru in Sabon Gari Local Government Area of Kaduna state. Samaru is located on latitude 11° 11'N and longitude 07° 37'E at an altitude of 550-700m within the northern guinea savannah zone of Nigeria. Annual rainfall ranges from 60mm to 708mm. The study was carried out between April and May, 2018.

Blood Sampling

A total of 100 samples were collected during the period of the study by convenience sampling. Five millilitres of blood was collected from each bird at the point of slaughter in sterile EDTA bottles and labelled according to the sex. The samples were transported to the Protozoology laboratory of the Department of Veterinary Parasitology and Entomology, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria for analysis.

Thin blood smear preparation

Thin blood smear was prepared on grease-free glass slides and stained according to standard procedure (Cheesbrough, 2000).

Ethical statement

Blood samples were collected from birds at the point of slaughter according to Islamic ethics of humane slaughter (Rahman, 2017).

RESULTS AND DISCUSSIONS

Results obtained were presented as charts and descriptive statistics. Haemoparasites of poultry are said to be endemic in Nigeria (Igbokwe *et al.*, 2008). Of the 100 birds examined, 81%, (Figure 1) were positive for 4 genera of haemoparasites; namely Plasmodium (49%), Aegyptianella (27%), Haemoproteus (21%) and Leucocytozoon (3%). This appears to be one of the highest prevalence rates so far reported in Nigeria. Workers across the country have reported prevalence rates that were all below the 81% observed in this study. Usman *et al.* (2012) reported 12% in Sokoto, Karamba *et al.* (2012 reported a prevalence of 19.56%) in Kano. Igbokwe *et al.* (2008) and Lawal *et al.* (2016) reported prevalence of 9.4% and 17% respectively from Maiduguri North eastern Nigeria. Lawal *et al.* (2019) also reported 19.6% in Gombe State. Maxwell *et al.* (2016) reported a prevalence of 30% in Eastern Nigeria. These differences were usually associated with differences in climates and seasons, with the wet periods corresponding to periods of greater vector activity and therefore higher prevalence (Igbokwe *et al.*, 2008; Ogunbenro and Morakinyo 2014). The fact that this work was done in the dry season (April and May), but still showed a very high prevalence (81%) indicated the possibilities of other unknown factors at play in the study area. Note, that most of these workers have studied local scavenger chickens under extensive management (Igbokwe, *et al.*, 2008; Lawal *et al.*, 2019). Local scavenger chickens are generally more resistant to these infections than exotic birds under commercial production such as broilers that formed the bulk (92%) of birds assessed in this work (Minga *et al.*, 2004). The prevalence of 81% is similar to the findings of Sabuni *et al.* (2011) and Hasson, (2015) who reported 79.2% and 76% prevalence rates in Kenya and Iraq respectively. These may be due to high density of poultry population in these countries.

It is generally accepted that extensively managed chickens constitute over 80% of the chicken population in Nigeria (Igbokwe *et al.*, 2008). The fact that 92% of the birds in this study were exotic broilers and only 8% were of the local scavenger variety is indicating a shift in management and modernization of the industry. The larger population of broilers slaughtered in comparison to local chickens, may not be unconnected with the fact that there are now more poultry farmers going into broiler production due to its higher profitability in the study area. There also seems to be a reversal of preference for broilers, because previously, local scavenger chickens were preferred to broilers by both farmers and consumers, because they possess qualities such as low production inputs, they hatch their eggs and brood their chicks. They have excellent taste, and are suitable for special dishes as reported by Horst (1991). Consumers now seem to

prefer broilers to local chickens, possibly because they are cheaper, have high muscle content and are tender (Salawu *et al.*, 2014).

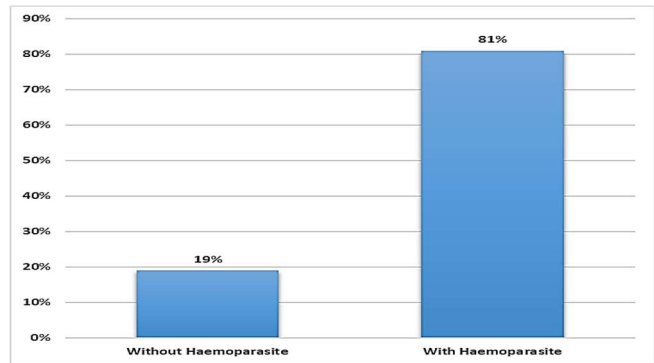


Figure 1: Prevalence of haemoparasites in chickens sampled from Samaru live bird market

Live Bird Market Out of the 100 birds sampled for haemoparasites, 55% were males while 45% were females. The higher prevalence in males than in females agrees with Al-Barwari and Saeed (2012) who reported a higher prevalence of haemoparasites in male chickens than in females, but disagrees with the reports of Hasson (2015) who reported a higher prevalence in females than in males. The higher prevalence in male chickens as reported here may be linked to the abundance of predilection site for blood sucking arthropods in the male because, anatomically they have larger combs and wattles that are well supplied with blood vessels and serve to attract blood sucking arthropods for blood meal during which they may transmit haemoparasites to the host (Lawal *et al.*, 2016).

Plasmodium species had the highest prevalence (49%) in this study, followed by Aegyptianella (27%), Haemoproteus (21%) and Leucocytozoon (3%) (Figure 2).

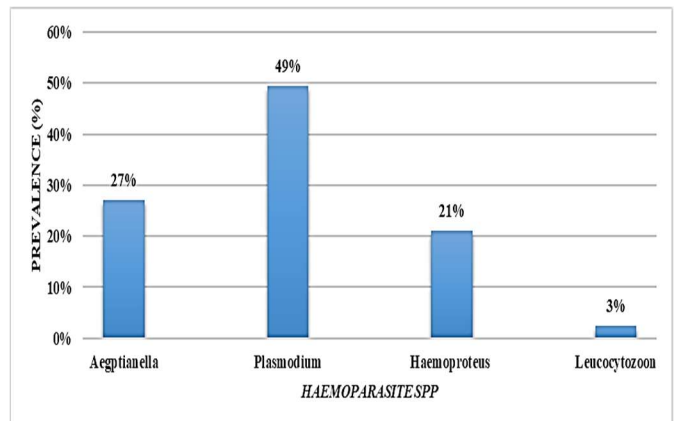


Figure 2: Distribution of specific haemoparasites in chickens sampled from the Samaru Live Bird Market

Igbokwe *et al.* (2008), Nazifi *et al.* (2008), Maxwell *et al.* (2016) and Lawal *et al.* (2019), in agreement with this study all reported plasmodium as having the highest prevalence. These agreed with the reports of Sadiq *et al.* (2003) and Abdullahi, (2013) who reported a higher prevalence of Plasmodium in chickens in their study locations. In some cases, the prevalence was up to 54.6% Mohammed *et al.*, (2019).

Although Plasmodium may not cause a devastating anemia in chickens, it is known to adversely affect other species such as the guinea fowl, Igbokwe *et al.* (2008). Chickens may therefore just be reservoirs of the parasite. However, this report contradicts that of Gimba *et al.* (2014), Hasson, (2015) and Lawal *et al.* (2016) who all reported a higher prevalence of Haemoproteus in chickens; this again may just be due to differences in climates and vector populations.

Conclusion

The prevalence of haemoparasites was found to be very high in Zaria at 81%, involving 4 genera; Plasmodium, Aegyptianella, haemoproteus and leucocytozoon. Of these, plasmodium has the highest prevalence of 49%. The prevalence in males was higher than in females.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Authors' Contribution

BHU designed the experiment. HB, MHMB and INM collected and analysed the samples. All authors have read and approved the final manuscript.

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