



## Prevalence of Ectoparasites Infestation Among Some Breeds of Chickens in Alqahira, Akko LG.A, Gombe State

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### ABSTRACT

Ectoparasitism has been identified as one of the major factors that threaten scavenging village chicken production systems in developing countries. The study examined the prevalence of ectoparasite infestation among chickens in Alqahira quarters in Akko local government, Gombe State. Two hundred chickens, which comprise three species namely: Naked neck, Venda and Ovambo of both sexes and various ages were sampled. Household with moderate to high numbers of chicken population and that were willing to voluntarily cooperate with the sampling procedures were randomly selected and included in the study, Sampling was carried out for a period of 2 months on weekly basis. Ectoparasites were collected from the body/skin of each bird and not from the ground in order to minimize accidental collections of other arthropods that do not actually parasitize chickens. Examination for ectoparasitic infestations was carried out early in the morning and in the evening. The result of ecto parasite infestation based on experimental site showed that Wurro bogga community has the highest number of chicken examined 80 (40%) and also the highest infestation 55 (68.75%). The result also showed that out of 200 chickens examined, 108 representing 54.0% were found to be infested with ectoparasite with female constituting the highest infestation 70 (64.81%) and males 38 (35.19%). The result further revealed that lice were found to be more abundant 48 (44.44%) followed by mites 28 (25.93%), fleas 17 (15.74%) and the least parasite was ticks 15 (13.89%) respectively. The result of the distribution of the ectoparasite based on breed revealed that venda chickens were found to be more infested 40 (37.04%) than ovambo 39 (36.11%) and naked neck 29 (26.85%), respectively. Application of integrated prevention and control measures like awareness creation to the community on the overall effect of ectoparasites on the productivity of chickens and prevention methods and further studies to cover investigation of endoparasites of chickens in the study area should be explored.

**Keywords:** Lice, Mites, Ticks, Venda, Ovambo, Naked neck

### INTRODUCTION

Chicken production specifically plays important socio-economic roles and significant contributions to human food production. Poultry production is an integral part of a balanced farming system; it has a unique

position in the rural household economic, supplying high quality protein to the family (Angyireyiri *et al.*, 2015). The poultry population was estimated at around 150 million with a large majority of local chickens and a minority of exotic breeds (FAO, 2000). Following the outbreak, the poultry sector



witnessed a brief decline before settling and today despite many problems, the poultry sector is again in expansion (Oscar Agricultural Consultant Limited, 2008).

Chicken constitutes about 70% of poultry production and Nigeria produces about 300,000 tons of poultry meat and 650,000 tons in egg per annum while Nigeria poultry association stated that Nigeria produces above 1.25 million tons of egg per year as against 650,000 tons, FAO (2013). It was as well surveyed that most cocks sold in Gombe markets were derived from the northern part of Gombe, a strong indication that ectoparasites of chicken may be country wide problem (Ikpeze *et al.*, 2008). Ectoparasites, which live on a chicken's surface, are mostly invertebrates, including arthropods (insects and arachnids). They are common in the tropics because of the favorable climatic conditions for their development and the poor standards of poultry husbandry (FAO, 2013).

Ectoparasitism has been identified as one of the major factors that threaten scavenging village chicken production systems in developing countries (Zuman, 2011). Reports have shown that mortality due to parasitic diseases is higher than those attributed to some poultry viral infectious disease such as Newcastle disease and fowl pox disease (Nnadi and George, 2010; Opara *et al.*, 2014). The chicken population in Nigeria is estimated to be 56 million, including free-range chicken and poultry chicken. Free range production is characterized by low input and low output, while poultry-keeping systems are characterized by high mortality caused by factors such as ectoparasites, poor management, and poor nutrition (Conroy *et al.*, 2005). However, common ectoparasites of chicken range from lice, mites, fleas and ticks (Nnadi and George, 2010). They may constitute a clinical problem and transmit a number of infectious diseases and can also act

as a transport to intermediate hosts of a range of helminthes parasite (Firol *et al.*, 2014). These external parasites compete for feed or cause distress to the chicken and hence cause anaemia, reduce growth, low egg production and may lead to death. The ticks and mites most especially act as vectors of poultry diseases such as pastuerellosis, fowlpox, Newcastle disease and possibly Chlamydia. This has been known to result in immune-suppression, especially in response to vaccines against some poultry diseases (Nnadi and George, 2010).

In addition, some species are bloodsuckers while others burrow into the skin or live in the feather and other parts of the chicken depending on their predilection sites e.g. lice (*Liperus spp*, *Menopon spp*), Soft ticks (*Argas spp*), Mites (*Dermanyssus spp*, *Ornithonyssus spp*), Fleas (*Echinophaga spp*) are mostly found on poultry chicken. Mites have been recognized as the cause of dermatitis and skin damage on all classes of poultry, while lice has been reported to be the most common and widely spread ectoparasites of chicken (Hobbenaghi *et al.*, 2012). The feeding larvae, nymphs, and adults of some of these ectoparasites causes dermatitis, irritation, restlessness and debility but in heavy infestation, anaemia may result, parasitism in poultry chicken consumes dead cells of the skin and tissue fluids, cause heavy morbidity by sucking blood while it adversely affects their economic productivity, drop in egg production and emancipation (Mungube *et al.*, 2006; Nyoni and Masika, 2012).

Meanwhile, adequate control of ectoparasitism of livestock (chicken) has mostly been concentrated on ticks and biting flies in ruminants because of economic significance of ectoparasite-borne disease (Ohaeri and Ugwu, 2013; Obi *et al.*, 2010). Sanitary management practices involving routine use of proven insecticide and acaricide have devastating

effects on poultry chicken caused by these ectoparasites has received little attention in almost all production systems, hence study with regards to determining the prevalence of such parasites and identifying their types and effects is fundamental in devising appropriate control methods.

## MATERIALS AND METHODS

### Study Area

Samples of chickens were collected from three locations in Alqahira quarters including Wuro Bogga, Sudaniya and Gurama, Gombe State, Gombe State lies on Latitude 10.283333 and longitude 11.166667

### Sampling Procedure

Two hundred chickens, which comprise three species namely Naked neck, Venda and Ovambo of both sexes and various ages were randomly selected for this study. Households with moderate to high numbers of chickens population and that were willing to voluntarily cooperate with the sampling procedures was randomly selected and included in the study, Sampling was carried out for a period of 2 months on weekly basis.

Sample size was determined according to the formula provided by Thrusfield (2005).

$$n = (1.96)^2 P_{exp} (1 - P_{exp}) / d^2$$

Where, n = required sample size,  $P_{exp}$  = expected prevalence and d = desired absolute precision

### Collection of Ectoparasites

Ectoparasites were collected from the body/skin of each bird and not from the ground in order to minimize accidental collections of other arthropods that do not actually parasitize birds. Examination for ectoparasitic infestations was carried out early in the morning and in the evening.

### Parasitological Procedures

An investigation of ectoparasite infestation in chickens was performed by carefully parting feathers horizontally against the anatomical direction of alignment so as to expose parasites and allow visual inspection of the skin and other parts of the birds' body. Ectoparasites were collected from the birds' bodies using forceps-picking and feather-brushing methods as described by Angyireyiri *et al.* (2015).

The bird's entire body was thoroughly inspected and gently brushed with a fine soft brush; special attention was paid to under the wings. In the case of strong attachment and embedded ticks, the ticks were removed using chloroform by dabbing the ticks and the skin.

Lice, fleas and mites were collected by dipping a brush in ethanol before combing and brushing the feather/skin of the bird onto a white blotting paper.

The parasites collected were preserved in 70% ethanol in well labeled glass vials.

### Ectoparasite Identification

Ectoparasite was identified according to keys and descriptions by Walker *et al.* (2003). Ectoparasite was examined under the light microscope and each morphological characteristic were observed and recorded for identification.

### Data Analysis

Data obtained for ectoparasites was analyzed using simple descriptive statistics. Data was analyzed using simple percentage to express the prevalent rate and frequencies of ectoparasite infestation.



## RESULTS

### Number of Chicken Examined and Number of Chickens Infested With Ectoparasite in Relation to Sample Site

Table 1 shows the number of chickens examined and the those found to be infested with ectoparasites in relation to experimental sites, Wuro bogga community has the highest number of chickens examined representing 80(40%) and also the highest infestation with 55(68.75%) followed by Sudaniya with 65 chickens representing 36.36% and 32 chickens were found to be infested with parasite representing 49.23% of the number infested,

the least number of chickens were found in Gurama with 55 representing 27.50% and also the least infestation with 21 chickens infested representing 38.18% infestation. It can be shown in the tables that Females chickens were more than the males sampled across all the three sites, in total, 125 females were sampled alongside 75 males, it can be deduce from the table that out of the 200 chickens used in this study, 108 representing 54.00% were found to be infested with ectoparasites with females constituting the highest number of 70 representing 64.81% and males 38 representing 35.19% respectively.

**Table 1:** Number of chicken examined and number of chickens infested with ectoparasite in relation to sample site

Location	No. of chickens examined	No. chickens infested with ectoparasite
Wuro Bogga	M-30(37.5%)	M-20(36.4%)
	F-50(62.5%)	F-35(63.6%)
	Total-80(40.00%)	Total-55(68.75%)
Sudaniya	M-25(38.5%)	M-10(31.25%)
	F-40(61.5%)	F-22(68.75%)
	Total-65(32.50%)	Total-32(49.23%)
Gurama	M-20(36.36%)	M-8(38.10%)
	F-35(63.64%)	F-13(61.90%)
	Total-55(27.50%)	Total-21(38.18%)
<b>Total</b>	<b>M-75(37.50%)</b>	<b>M-38(35.19%)</b>
	<b>F-125(62.50%)</b>	<b>F-70(64.81%)</b>
	<b>Total-200</b>	<b>Total-108(54.00%)</b>

### Number of Chickens Breed in Relation to Sample Site

Table 2 shows the number chickens breeds examined in relation to experimental sites, Venda chickens were found to be more abundant with highest number of 73(36.50%) of the total chickens examined in which Wuro bogga has constitutes the highest number 31(42.47%) followed by Sudaniya 24(32.88%) and least Gurama 18(24.66%). Ovambo chicken breed was the second highest breed 66(33.00%) in which Wuro bogga has constitutes the highest number 25(37.88%) followed by Sudaniya 22(33.33%) and least Gurama 19(28.79%). A total of 61(30.50%) of Naked neck chickens were examined for ectoparasites infestation 24(39.34%), 19(31.15%) and 18(29.51%) respectively.



**Table 2:** Number of chickens breed in relation to sample site

Location	Naked neck	Venda	Ovambo	Total
Wuro Bogga	24(39.34%)	31(42.47%)	25(37.88%)	80(40.00%)
Sudaniya	19(31.15%)	24(32.88%)	22(33.33%)	65(32.5%)
Gurama	18(29.51%)	18(24.66%)	19(28.79%)	55(27.50%)
<b>Total</b>	61(30.50%)	73(36.50%)	66(33.00%)	200

**Prevalence of Ectoparasites in Chickens in Relation to Gender Distribution**

Table 3 showed the prevalence of ectoparasite infestation in relation gender, it can be deduced from the table that of the 200 chickens examined, 108 are found to be

infested with ectoparasites, highest number of 70 females and 38 males in percentage infestation of (64.81%) and (35.19%) respectively. Lice were found to be more abundant 48(44.44%) followed by Mites 28(25.93%), Fleas 17(15.74%) and least Ticks 15(13.89%).

**Table 3:** Prevalence of ectoparasites in chickens in relation to gender distribution

Gender	Total No. of chickens examined	Lice	Ticks	Mites	Fleas	Total No. of chickens infested
Males	75(37.50%)	13(27.08%)	7(46.67%)	11(39.29%)	7(41.18%)	38(35.19%)
Females	125(62.50%)	35(72.92%)	8(53.33%)	17(60.71%)	10(58.82%)	70(64.81%)
Total	200	48(44.44%)	15(13.89%)	28(25.93%)	17(15.74%)	108

**Prevalence of Ectoparasites of Chickens in Relation to Breed Distribution**

Table 4 shows the prevalence of chickens in relation to breed of the chickens examined, Venda chickens has the highest number of infestation 40(37.04%) followed by Ovambo

39(36.11%) and Naked neck 29(26.85%). Lice is more prevalent across all the three breeds of chickens with a total of 41(37.96%) followed by Mites 26(24.07%), closely followed by Fleas 25(23.15%) and least prevalent is Ticks 16(14.81%).

**Table 4:** Prevalence of ectoparasites of chickens in relation to breed distribution

Breeds	Total No. of chickens examined	Parasites				Total No. of chickens infested
		Lice	Ticks	Mites	Fleas	
Naked neck	61(30.50%)	11(26.83%)	3(18.75%)	7(26.92%)	8(32.00%)	29(26.85%)
Venda	73(36.50%)	17(41.46%)	6(37.50%)	9(34.62%)	8(32.00%)	40(37.04%)
Ovambo	66(33.00%)	13(31.71%)	7(43.75%)	10(38.46%)	9(36.00%)	39(36.11%)
Total	200	41(37.96%)	16(14.81%)	26(24.07%)	25(23.15%)	108

**DISCUSSION**

The result of chicken sampling and ecto parasite infestation based on the experimental site showed that Wurro bogga community has

the highest number of chickens examined 80 (40%) and also the highest infestation 55 (68.75%) while Sudaniyya and Gurama had 65 and 55 chicken examined representing 36.36% and 27.50% respectively, the higher number of



chickens in Wuro bogga community may be as a result of it being a rural settlement followed by Sudaniya which an extension of Peri-urban settlement, the least number of chickens in Gurama might be as a result of it been a peri-urban settlement in which members of the community mostly reared exotic breed of chickens. The result further revealed that 32 (49.23%) and 21 (38.18%) chicken from Sudanniya and Gurama were found to be infested with ectoparasites, respectively. The least percentage infestation encountered in Gurama might be because of the practice of proper hygiene compared to Wuro bogga and Sudaniya, respectively. The result further depicts that females 125 (62.5%) chicken were more than males 75 (37.5%) were sampled across three locations, this contradicts the work of Ismail *et al.*, 2014 in his research titled "prevalence of ectoparsite in local breed of chickens in Gombe local government" who discovered males 410 (52.40%) over females 373 (47.60%) in his study in Gombe, the difference may be as a result of differences in sampling location.

The result also showed that out of 200 chickens sampled 108, representing 54.0% were found to be infested with ectoparasite with female constituting the highest number 70 (64.81%) and males 38 (35.19%) this result is in agreement with the work of Omaka, 2021 who revealed that out of 300 chickens examined, 52.0% were found to be infested with one or more ectoparasite.

The result also depicts that chickens were examined based on breed and experimental site, the result showed that venda chickens were found to be the most abundant during the study period constituting 73 (36.50%) of the total chickens in which Wuro bogga has the highest number 31 (42.47%) while Sudaniyya and Gurama had 24 (32.88%) and 18 (24.66%) respectively. Ovambo chickens breed were 66 (33.0%) in which Wuro bogga had 25 (37.88%)

while Sudaniyya and Gurama had 22 (33.33%) and 19 (28.79%) respectively. Naked neck breed of chickens was 61 (30.50%) in which 24 (39.34%) were from Wuro bogga while 19 (31.15%) and 18 (29.51%) were from Sudaniyya and Gurama, respectively.

The result further revealed that lice were found to be more abundant 48 (44.44%) followed by mites 28 (25.93%), fleas 17 (15.74%) and ticks 15 (13.89%) respectively. The result of the distribution of the ecto parasite based on breed revealed that venda chickens were more infested 40 (37.04%) than ovambo 39 (36.11%) and naked neck 29 (26.85%), respectively. Lice is more prevalent across all the three breeds of chickens with a total of 41 (37.96%) followed by Mites 26 (24.07%) while fleas and ticks constitute 25 (23.15%) and 16 (14.81%) respectively this agrees with the work of Wario *et al.*, 2018 who determines the Prevalence of major ectoparasites of poultry in extensive and intensive farms in Jimma, Southwestern Ethiopia reveals Lice as the most prevalent ectoparasite

## CONCLUSION

The study indicated that Ectoparasites were prevalent in the study area at 54% infestation with lice been the most prevalent, female chickens had the highest prevalence at 70% compared to male and venda breed were discovered to harbor more parasite.

## Recommendations

The application of integrated prevention and control measures like awareness creation to the community on the overall effect of ectoparasites on the productivity of chickens and prevention methods should be employed.

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