

Prevalence of Ectoparasite Infestation in Domestic Chickens *Gallus Domesticus* **(A Case Study Of Damaturu Main Market)**

*¹Alhaji Goni Kyari and Adamu Mohammed²

Department of Applied Biology,
School of Science and Technology,
The Federal Polytechnic, P.M.B 1006,
Damaturu, Yobe State, Nigeria.
Corresponding author: kyarigoni121@gmail.com

ABSTRACT

This research was carried out to determine the prevalence of ectoparasites infestation in domestic chickens in Damaturu main market. The aimed of this research is to identify ectoparasites in domestic chickens by direct examination method. A total of 240 chicken samples were examine and analyzed, the following species were identified viz: ticks (Ixodida), lice (Phthiraptera) and fleas (Siphonaptera) respectively. The research revealed that the infection rate with ticks 10%, fleas 33% and lice 6%. The investigation also revealed that ectoparasites infestation of *Gallus domesticus* was high in females with 20% than that of the males with 10%. This is probably due to the fact that the female chickens have large body surface and high fat content than the males, the research concluded that ectoparasites infestation in domestic chickens can scared people from investing. The research also recommended that sanitation and hygiene is highly encourage, it is also recommended that chemical such as carbonyl can reduce ectoparasites infestation in *Gallus domesticus*.

Keywords: *Ectoparasites, Gallus domesticus, infestation, prevalence, species*

INTRODUCTION

Chicken production is broadly undertaken as commercial or subsistence enterprises. Commercial enterprises confine flocks in houses and manage them either on a battery cage or deep litter, providing feed, medication, and lighting. The subsistence sub-sector keeps chickens in the backyards of urban, semi-urban, and rural areas (Usman *et al.*, 2012).

Ectoparasites of chickens are widely distributed in tropical and subtropical environments, including many different species of lice, fleas, and soft ticks these ectoparasites are known to negatively impact poultry products and public health. For instance, ectoparasite infections in chickens have resulted in growth retardation, reduced egg-laying, poor feed conversion efficiency, lameness, blindness, restlessness, and other detrimental effects. Humans have been accidentally infested by ectoparasites during chicken management, causing discomfort and severe allergies (Usman *et al.*, 2012, Wario *et al.*, 2018).

Poultry farming plays a significant role in the agriculture sector, particularly in developing countries where it serves as a good source of animal protein and income. Among domestic poultry species, chickens are the most commonly reared. However, poultry production faces numerous challenges, among which ectoparasite infestations are particularly detrimental. Ectoparasites are parasites that live on the external body surface of the host and feed on blood, skin, or feathers. In chickens, these include lice, fleas and ticks. These parasites can cause significant economic losses through reduced growth rates, decreased egg production, anemia, skin infections, feather damage or loss, and in severe cases, death. Furthermore, ectoparasites can act as vectors of other pathogenic organisms, thereby complicating their impact on poultry health.

Aim and Objectives of the research

Aim

The aim of this research is to identify the ectoparasites of chickens commonly sold in Damaturu main market.

Objectives

The objectives of the research work are as follows:

1. To identify ectoparasites of chickens.
2. To determine the prevalence of ectoparasites of chickens.
3. To find the variation of ectoparasites in male and female chickens commonly sold in Damaturu main market.

MATERIALS AND METHODS

The following were used

Apparatus

- i. Forceps
- ii. Brush
- iii. Hand lens
- iv. Maskin Tape
- v. Specimen bottle
- vi. Hand gloves
- vii. Microscope

Reagents

- i. Formaling
- ii. Alcohol

Biological Specimen

Local chickens

*Prevalence of Ectoparasite Infestation in Domestic Chickens Gallus Domesticus
(A Case Study Of Damaturu Main Market)*

Methods

Physical Examination of Chicken

Each chicken was physically restrained and examined systematically. The feathers and skin, particularly around the wings, neck, vent, under the wings, and tail, were inspected for ectoparasites. Feather brushing and gentle hand picking was used to collect visible parasites.

Study Area

The study area is located in Damaturu main market which located at Potiskum Road, a total 240 chickens of different age and sex group were randomly select, meanwhile, Damaturu being the capital of Yobe State. Is the centre of most economic transaction of chicken supply with very large number of chicken sold at the popular Damaturu main market, the study was carried out between month of August and September, 2025

Collection and Preservation of Ectoparasites

Ectoparasites were carefully removed using forceps and soft brushes, and then preserved in specimen bottle containing 70% ethanol. Each specimen bottle was labeled with a code identifying the bird and location of collection.

Sampling

A total of 240 chickens compose of male and female were randomly selected from different poultry locations using simple random sampling. The chickens were of different ages, sexes, and rearing systems (intensive, semi-intensive, and free-range). At each location, chickens was carefully handled to minimize stress during ectoparasite examination and collection.

Laboratory Identification and Preservation

In the laboratory, the preserved ectoparasites were examined under a dissecting microscope to observe their external morphology. For further identification, light microscopy was used after mounting selected specimens in glycerin or lactophenol on glass slides.

Identification was done using standard taxonomic keys and morphological descriptions as outlined in literature by Soulsby (1982) and other parasitology references. Ectoparasites such as lice (*Menacanthus stramineus*), and fleas or ticks were identified based on features such as body segmentation.

Data Analysis

Data was analyzed using descriptive statistics to obtain frequencies, means and standard were determine by parasite count and mean number of parasite calculated, these were compare between local, sex, age and species composition.

Quantification of Ectoparasites

Quantification involved determining the number and types of ectoparasites collected from each individual chicken. This was done to measure the intensity of infestation and to identify which ectoparasites were most prevalent.

Results

Prevalence of ticks, fleas and lice among *Gallus domesticus*.

In the course of the research which was conducted for a period of 12 weeks, the following species of ectoparasites were encountered viz: ticks (Ixodida), fleas (Siphonaptera) and lice (phthiraptera).

Table 1: Infection rate of *Gallus domesticus* with ticks (Ixidida)

Sampling period (week)	Number examine	Number infected	Number uninfected	Percentage infection rate
------------------------	----------------	-----------------	-------------------	---------------------------

*Prevalence of Ectoparasite Infestation in Domestic Chickens Gallus Domesticus
(A Case Study Of Damaturu Main Market)*

Week 1	20	03	17	15
Week 2	20	02	18	10
Week 3	20	00	20	00
Week 4	20	03	17	15
Total	80	08	72	

Table 2: Infection rate of *Gallus domesticus* with fleas (*Siphonaptera*)

Sampling period (week)	Number examine	Number infected	Number uninfected	Percentage infection rate
Week 1	20	09	11	45
Week 2	20	08	12	40
Week 3	20	07	13	35
Week 4	40	03	17	15
Total	80	27	53	

Table 3: Infection rate of *Gallus domesticus* with lice (*Phthiraptura*)

Sampling period (week)	Number examine	Number infected	Number uninfected	Percentage infection rate
Week 1	20	01	19	05
Week 2	20	03	07	15
Week 3	20	01	19	5
Week 4	20	00	20	0
Total	80	05	75	

Table 4: Variation in infection among male and female *Gallus domesticus* with ticks (*Ixodida*)

MALE					FEMALE				
Sampl e Period (week)	No examine d	No infecte d	No uninfecte d	% infecte d	Sampl e Period (week)	No examine d	No infecte d	No uninfecte d	% infecte d
Week 1	10	01	09	10%	Week 1	10	02	08	20%
Week 2	10	00	10	00%	Week 2	10	01	09	10%

*Prevalence of Ectoparasite Infestation in Domestic Chickens Gallus Domesticus
(A Case Study Of Damaturu Main Market)*

Week 3	10	02	08	20%	Week 3	10	00	10	10%
Week 4	10	00	10	00%	Week 4	10	02	08	20%
Total	40	03	37		Total	40	05	35	

Table 5: Variation in infection among Male and Female *Gallus domesticus* with fleas ((*Siphonaptera*))

MALE					FEM ALE				
Sample Period (week)	No examined	No infected	No uninfected	% infected	Sample Period (week)	No examined	No infected	No uninfected	% infected
Week 1	10	01	09	10%	Week 1	10	03	07	30%
Week 2	10	03	07	30%	Week 2	10	05	05	50%
Week 3	10	02	08	20%	Week 3	10	04	06	40%
Week 4	10	04	06	40%	Week 4	10	05	05	50%
Total	40	10	30		Total	40	17	23	

Table 6: Variation infection among male and female *Gallus domesticus* of lice with (*Phthiraptera*)

MALE					FEMALE				
Sample	No examined	No infected	No uninfected	% infected	Sample	No examined	No infected	No uninfected	% infected

*Prevalence of Ectoparasite Infestation in Domestic Chickens Gallus Domesticus
(A Case Study Of Damaturu Main Market)*

Period (week)					Period (week)				
Week 1	10	00	10	00%	Week 1	10	01	09	10%
Week 2	10	01	09	10%	Week 2	10	00	10	00%
Week 3	10	01	09	10%	Week 3	10	02	08	20%
Week 4	10	00	10	00%	Week 4	10	00	10	00%
Total	40	02	38		Total	40	03	37	

Table 7: Ectoparasite Species Observed During Investigation Period

S/N	Species of Ectoparasites	Number Observed	Percentage
1	<i>Ixodida species</i>	08	3.30%
2	<i>Siphonaptera species</i>	27	11.0%
3.	<i>Phthiraptera species</i>	05	2.0%
	Total	40	

DISCUSSION

Table 1 with shows the infection rate of *Gallus domesticus* with ticks, indicate that 08 were found to be infected with ticks (*Ixodida*) while 72 were not infected with ticks. Also in table 2, with shows infection rate of *Gallus domesticus* with fleas, also revealed that 27 out of 80 chickens were infected with the fleas representing 33%. In table 3, which shows that the infection rate of chickens with lice is 05 out of 80 representing 06%. In table 4, with indicate the variation in infection among males and females *Gallus domesticus* with ticks shows that the females were more infected 05 (12.5%) than the males 03 (7.5%). Also in table 5, which shows variation in infection among males and females *Gallus domesticus* with fleas revealed that females are

more infected 17 (42.5) than the males 07 (17.5%). Also in table 6, with indicate that the variation in infected among males and females chickens with lice, shows that the females were more infected 03 (7.5%) than the males 02 (05%) respectively.

Domestic chickens play a very significant role provision in meat and proteineous diet but the challenge is usually faced is that of ectoparasites. The effect of ectoparasites on *Gallus domesticus* cannot be over emphasized, they drastically reduce the production of eggs and meat in domestic chickens Joseph 2020. The ability to survive without a blood meal for several months in cracks or other suitable places have contributed to the high rate of infection. From the research work, out of 240 chickens sampled and examine for ectoparasites 33.3% were found to be infected

*Prevalence of Ectoparasite Infestation in Domestic Chickens Gallus Domesticus
(A Case Study Of Damaturu Main Market)*

167% were not infected, 10% of males chickens were infected while 20% of females chickens were infected. This shows that female chickens were more infected than the male this is because females particularly live in close proximity to one another, females they have larger body surface and higher fat content than the males which can provide a larger surface area and more nutritional resources for ectoparasites to exploit. It's also revealed that females have higher burden due to their role in nursing offspring and creating nests, which may be more favorable environment for ectoparasites development.

CONCLUSION

Most of the *Gallus domesticus* examine for the ectoparasites were found to be infected, this can seriously reduce the product in chickens (*Gallus domesticus* investment) and scare people investing in poultry establishment in region, from the results obtain, about 30% of *Gallus domesticus* examine in Damaturu main market are infected with ectoparasites (lice, fleas and ticks).

RECOMMENDATIONS

Based on the research obtained the following recommendations were made

1. Sanitation involves cleaning and disinfecting housing facilities and equipment between flocks, eliminating the contact between infected and non-infected.
2. In considering the impact of Ectoparasites of *Gallus domesticus* examples low egg production and high mortality rate. It's desirable to enforce

sanitation and cleanness as key to lice, fleas and ticks control.

3. Use Integrated Pest Management (IPM), these strategies that combine physical, cultural and chemical to manage Ectoparasites populations, Chemical control can include the use of carbonyl. Treat the wall, flow and neck boxes when dusting the entire house, be carefully to avoid feed contamination.
4. Provide proper nutrition: Ensure chickens receiving a balanced diet that include essential nutrients to them resist Ectoparasites infestation.

REFERENCES

- Ahaotu, E. O., (2019). Microbiological Assessment of Packaged Drinking water in Rural Communities of Imo State, Nigeria. *African Journal of Environmental Science*. **13(2)**. 112–120Pp.
- Firod, A. K., and Umar, D. S., (2014). Bacteriological Quality and Health Risk Assessment of Bottled Water Sold in Nigerian Tertiary Institutions. *Journal of Public Health and Epidemiology*. **6(5)**. 77–83.Pp
- Ikpeze, T. O. and Uzoigwe, C. I., (2008). Comparative Microbial Load Of Bottled and Sachet Water in Onitsha Metropolis, Nigeria. *Nigerian Journal of Microbial Research*. **9(3)**. 155–161pp.
- John, A. T. and Mohammed, Y. U., (2017). Evaluation of Coliform Contamination in Selected Commercial Bottled Water Brands in Kaduna State, Nigeria.

- International Journal of Microbiology and Hygiene*. **4(1)**. 45–52.**pp**
- Joseph, E. (2020). Epidemiological Survey on the Prevalence of Ectoparasites in Local and Commercial Poultry Birds in Northern Nigeria. *Journal of Veterinary and Poultry Science*. **12(3)**. 45–52.**pp**
- Lawd, J. S., Chukwu, L. O., and (2016). Assessment Of Bacteriological Content Of Bottled Water Marketed in Lagos, Nigeria. *Journal of Environmental and Food Microbiology*. **8(4)**, 223–229.**pp**
- Nnco, F. O., and Gevge, L. P. (2010). Sanitary Survey and Microbial Analysis of Bottled Water in the Nigerian Urban Market. *Journal of Tropical Health Sciences*. **14(2)**. 88–94.**pp**
- Sebumi, A. A. and Olabisi, O. M., (2011). Isolation of Pathogenic Bacteria from Bottled Water and Implications for Public Health in Southwest Nigeria. *Nigerian Journal of Biomedical Research*. **10(1)**. 39–47.**pp**
- Usman, A. K. and Ibrahim, M. A., (2012). Bacteriological Analysis of Drinking Water Sources In Damaturu, Yobe State, Nigeria. *Nigerian Journal of Basic and Applied Sciences*. **20(3)**.201–207.**pp**