International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Comparative Studies of Prevalence of Ectoparasites of Cows and Goats Sold In Lokoja Area of Kogi State

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Abstract: ***An investigation of ectoparasites of some livestock sold in Felele, Old market (Karaworo area), and International (Sarki Noma) Markets, of Lokoja, Kogi Statei, Nigeria was conducted in March 2019. Fifteen (15) cows and fifteen (15) goats were examined. Visual screening, handpicking, use of forceps and brushing methods were employed in the ectoparasites collection. Out of 15 cows examined a total of 181 ectoparasites were isolated with tick having the highest prevalence of 116 (64.1%) followed by lice 48(26.5%) and the least number is mite with 17(9.4%) prevalence rate. Also out of 15 goats examined, a total of 161 ectoparasites were isolated with tick having the highest prevalence of 95(57.1%), followed by lice 46(28.6%) and the least is mite with 23(14.3%). This shows that the prevalence of ectoparasite on cow is more than that of goat. Cows were infected with a total of 181 ectoparasites while goats were infected with a total of 161 ectoparasites. The prevalence of cow and goat for tick is 116(64.1%) and 92(57.1%) respectively, for lice is 48(26.5%) and 46(28.6%) respectively and for mite is 17(9.4%) and 23(14.3%) respectively. From the comparism so far, results shows that ectoparasites are more prevalent in cows than goats.***

Keywords: Ectoparasites, Livestock, Ticks, Lice, Flea, Lokoja, Felele, Infestation, Prevalence

1. Introduction

Study of ectoparasites and the diseases they transmit has been necessitated by the significant impact on human and peri-domestic animals such as livestock and service dogs. Vector-borne microorganisms, including numerous pathogens, persist in nature in various arthropods whose prevalence may be expanding due to global warming and human activities that promote favorable conditions for these arthropods. These activities include farming practices, community sports and amusements, globalization of travel and trade, and forest encroachment, which facilitate human exposure to agents propagated in these modified environments. They may also ease the transmission of previously rare agents and increase the numbers of infected hosts and carriers, mostly through more frequent exposure of naïve hosts and domestic animals to these vectors. The economic and veterinary impacts of these ectoparasites on livestock in Nigeria and around the world, has necessitated a more aggressive research and control approach to these ectoparasites.

2. Study Area

Lokoja metropolis is the study area and it is located on the confluence of River Niger and River Benue. It is the capital city of Kogi State and can be found between latitude 7° 45' 27.56" - 7° 51' 04.34" N and longitude 6°41' 55.64" - 6°45' 36.58" E of the equator with a total land coverage of about 63.82 sq. km.

3. Methodology

The study animals (15 male and 15 female) were screened for ectoparasites using standard techniques

Ectoparasite Collection

Physical Screening and Visual Inspection
Physical screening and visual inspection of the neck, eyes, ears, udder, external genitilia, thighs, tails and legs of the cows and goats after proper physical restraining of the animals were performed to search for ectoparasites, Forceps were used to pick out ectoparasites from hidden parts of the body.

Hand-Picking
With the aid of light surgical gloves, the ectoparasites were hand-picked by systematically searching the various body regions of the study animals. Ectoparasites obtained from the different animals, as well as the different body regions were kept separately in 70% alcohol in labeled collecting tubes for identification and counting**.**

Brushing
With this method, each study animal was placed on a piece of white calico and the ectoparasites systematically brushed the hair (for goats and cows). The ectoparasites were recovered from the calico by dipping the finger into 70% alcohol and tapping gently with the finger. The ectoparasites were then detached into labeled collecting tubes. Ectoparasites from the different animals, as well as the different body regions were kept separately for identification and counting in the laboratory.

Identification
After proper restraining, representative specimens were collected from infested and diseased animals. Ectoparasites (ticks, lice, and mites) either encountered on the skin surface or attached to the hair were collected manually from their sites of attachment. The ticks were removed from the host skins whilst retaining their mouth parts for identification using thumb forceps. A coat brushing technique was applied to collect lice from host skin. Then the collected samples

were placed in labelled universal bottles containing 70% ethanol and taken to the Kogi State Polytechnic laboratory. In the laboratory, the ectoparasites were identified with the basis of their morphological structure using the recommendations of Urquhart et al. [1996] and Wall and Shearer [2001]. Further identification at species level was conducted using a stereomicroscope according to their key morphological structures using Walker et al. [2000] suggestions for ticks and Urquhart et al. [1996] and Wall and Shearer [2001] for lice and fleas

4. Results

Table 1: Prevalence of ectoparasite of cow in felele area with respect to sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	3	3	42(59.2%)	6 (8.4%)	5(7%)	53(74.6%)
Female	2	2	13(18.3%)	4(5.6%)	1(1.4%)	18(25.4%)
Overall Total	5	5	55(77.5%)	8(14.1%)	5 (13.5%)	71(100)

Table 1 above shows the prevalence of ectoparasite of cow in Felele area with respect to sex. Out of five cows examined 3 were male while 2 were female. Male were infected with 42 ticks (59.2%), 6 lice (8.4%) and 5 mites (7%) with a prevalence rate of 74.6% while females were infected with 13 ticks (18.3%), 4 lice (5.6%) and 1 mite (1.4%) with a prevalence rate of 25.4%. results shows that male cow were more infected with ectoparasites than females in Felele area Lokoja.

Table 2: Prevalence of Ectoparasite of Cow in old Market with Respect to Sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	4	4	35 (41.1%)	25 (29.4%)	8 (9.4%)	68 (80%)
Female	1	1	12 (14.1%)	5 (5.9%)	0 (0.0%)	17 (20%)
Overall Total	5	3	47 (55.3%)	30 (35.3%)	8(12%)	85 (100)

Table 2 above shows the prevalence of ectoparasite of cow in Old market with respect to sex. Out of five cows examined 4 were male while 1 is a female. Male were infected with 35 ticks (41.1%), 25 lice (29.4%) and 8 mites (9.4%) with a prevalence rate of 80 % while females were infected with 12 ticks (14.1%) and 5 lice (5.9%) with a prevalence rate of 20%. result shows that male cows were more infected with ectoparasites than females in Old market Lokoja.

Table 3: Prevalence of Ectoparasite of Cow in International Market with Respect to Sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	2	2	7 (28%)	2 (8%)	3 (12%)	12 (48%)
Female	3	3	7 (28%)	6 (24%)	0 (0.0%)	13 (52%)
Overall Total	5	5	14 (56%)	8 (32%)	3 (12%)	25 (100)

Table 3 above shows the prevalence of ectoparasite of cow in International market with respect to sex. Out of five cows examined 2 were male while 3 were female. Male were infected with 7 ticks (28%), 2 lice (8%) and 3 mites (12%) with a prevalence rate of 48% while females were infected with 7ticks (28%) and 6 lice (24%) with a prevalence rate of 52%. result shows that female cow were more infected with ectoparasites than male cow International market Lokoja.

Table 4: Prevalence of Ectoparasite of Goat in Felele area with Respect to Sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	4	4	21 (52.5%)	9 (22.5%)	4 (10%)	34 (85%)
Female	1	1	1 (2.5%)	2 (5%)	3 (7.5%)	6 (15%)
Overall Total	5	3	22 (55%)	11 (27.5%)	7 (17.5%)	40 (100)

Table 4 above shows the prevalence of ectoparasite of goat in Felele area with respect to sex. Out of five goats examined 4 were male while 1 is a female. Male were infected with 22 ticks (55%), 11 lice (27.5%) and 7 mites (17.5%) with a prevalence rate of 85% while females were infected with 1 ticks (2.5%), 2 lice (5%) and 3 mite (7.5%) with a prevalence rate of 15%. result shows that male goats were more infected with ectoparasites than female in Felele area Lokoja.

Table 5: Prevalence of Ectoparasite of Goat Old Market with Respect to Sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	2	2	15 (33.3%)	3 (6.6%)	2 (4.4%)	20 (44.4)
Female	3	3	15 (33.3%)	7 (15.5%)	3 (6.6%)	25 (55.5)
Overall Total	5	5	30 (66.6%)	10 (22.2%)	5 (11.1%)	45 (100)

Table 5 above shows the prevalence of ectoparasite of goats in Old market with respect to sex. Out of five goats examined 2 were male while 3 were female. Male were infected with 15 ticks (33.3%), 3 lice (6.6%) and 2 mites (4.4%) with a prevalence rate of 20% while females were infected with 15ticks (33.3%), 7 lice (22.2%) and 3 Mites (6.6%) with a prevalence rate of 25%. result shows that female goats were more infected with ectoparasites than male goats in Old market Lokoja.

Table 6: Prevalence of Ectoparasite of Goat in International with Respect to Sex

Sex	No examined	No infected	Tick	Lice	Mites	Total (%)
Male	2	2	17 (22.4%)	11 (14.5%)	11 (12%)	39 (51.3)
Female	3	3	23 (30.3%)	14 (18.4%)	0 (0.0%)	37 (48.7)
Overall Total	5	3	40 (52.6%)	25 (32.8%)	11 (12%)	76 (100)

Table 6 above shows the prevalence of ectoparasite of goat in International market with respect to sex. Out of five goats examined 2 were male while 3 were female. Male were infected with 17 ticks (22.4%), 11 lice (14.5%) and 11 mites (12%) with a prevalence rate of 51.3% while females were infected with 23 ticks (30.3%) and 14 lice (18.4%) with a prevalence rate of 48.7%. result shows that male cow were more infected with ectoparasites than female cow in International market Lokoja.

Table 7: Prevalence of Ectoparasites of Cow according to Species of Parasite

Ectoparasites Observed	No of Cows Infectected	Total Cows Examined	Total No Infected	Percentage
TICKS: *Ixodes sp; amblyonmasp; Rhipicephalus microplus*	7; 9; 15;	15	15	46.6%;60%;100%resp
LICE: *Linognathusspp*	15	15	15	100%
MITE: *Sarcoptesscabiei*	3	15	15	20%

Table 7 above shows the prevalence of ectoparasites according to specie. Out of the 15 cows examined all were infected with ectoparasites. Table shows that cow were infected with ticks. Cow were infected with *Ixodes holocyclus*, 7 (46.6%), *Amblyommatriguttatum* 9 (60%) and *Rhipicephalus microplus 15* (100%). Table also shows that cow were infected with lice. Cow were infected with *Linognahusspp*15 (100%). Cow were also infected with mites. Cows were infested with *Sarcoptesscabiei 3 (20%)*. Result shows that cow were more infected with tick species followed by lice species and the least is the mite specie.

Table 8: Prevalence of Ectoparasites of Goat according to Species of Parasite

Ectoparasites Observed	*No of Goats Infectected*	*Total Goats Examined*	*Total No Infected*	*%*
TICKS: *Boophiliusdecolorants; Rhipicephalus sanguineus; Ixodes tasmani*	11; 8; 3	15	15	73.3% 53.3%; 33.3%resp
LICE: *Linognathusspp; Bovicolaspp*	10 3	15	10	63.3% 20%
MITE: *Sarcoptesscabiei*	7	15	15	46.6%

Table 8 above shows the prevalence of ectoparasites according to specie. Out of the 15 goats examined all were infected with ectoparasites. Table shows that goats were infected with ticks. Goat were infected with *Boophiliusdecolorants 11 (73.3%), Rhiphicephalussanguineus 8(53.3%) and Ixodes tasmani 5(33.3%).* Table also shows that cow were infected with lice. Goat were infected with *Linognahusspp*10 (66.6%) and *Bovicolaspp* 3 (20%). Goat were also infected with mites. Goats were infested with *Sarcoptesscabiei 7 (20%)*. Result shows that goats were more infected with tick species followed by lice species and the least is the mite specie.

Table 9: Comparism of the Prevalence of Ectoparasite Found in Cow and Goats

Sample	No. examined	No. infected	Tick	Lice	Mites	Total	Total Percentage
Cow	15	15	116(64.1%)	48(26.5%)	17(9.4%)	181	52.9%
Goat	15	15	92(57.1%)	46 (28.6%)	23(14.3%)	161	47.1%
Total	30	30	208 (60.8%)	94(27.48%)	40	342	100%

Table 15 above, shows the comparison of the prevalence of ectoparasite found in cow and goat. Out of 15 cows examined a total of 181 ectoparasites were isolated with tick having the highest prevalence of 116 (64.1%) followed by lice 48(26.5%) and the least number is mite with 17(9.4%) prevalence rate.

Also out of 15 goats examined, a total of 161 ectoparasites were isolated with tick also having the highest prevalence of 95(57.1%), followed by tick 46(28.6%) and the least is mite with 23(14.3%).

From the comparison above it can be deduced that the prevalence of ectoparasite on cow is more than that of goat although the difference between the two is not significant enough. Cows were infected with a total of 181 ectoparasites while goats were infected with a total of 161 ectoparasites. The prevalence of cow and goat for tick is 116(64.1%) and 92(57.1%) respectively, for lice is 48(26.5%) and 46(28.6%) respectively and for mite is 17(9.4%) and 23(14.3%) respectively. From the comparison so far, results shows that ectoparasites are more prevalent in cow than goat.

5. Discussions

The prevalence 116(64.1%) ticks in cows agrees with the survey study by .Musa. H.I., et al.(2014) on the Prevalence of Tick Infestation in Different Breeds of Cattle in Maiduguri, A survey study was conducted from June to December 2009 using standard parasitological procedures to determine the prevalence of tick infestation among cattle of different breeds in Maiduguri, Northeastern Nigeria. The tick species identified were Boophilusmicroplus, Amblyomma variegatum , Hyalomma spp., Rhipicephalus sanguineous and Ornithodorus spp. Of the 205 cattle examined, 63.4% were tick infested. James-Rugu and Jidayi reported that 26.5% of 400 goats and 43% of 500 sheep were infested by ticks. This agrees with the findings of this

survey; The prevalence of cow and goat for tick is 116(64.1%) and 92(57.1%) respectively, for lice is 48(26.5%) and 46(28.6%) respectively and for mite is 17(9.4%) and 23(14.3%) respectively. Goats are known to graze less and graze just within the home compared to sheep and cattle that graze far into the bush hence come in contact with more vegetation and subsequently more ectoparasites. James-Rugu&Iwuala (2002) recorded infestation rate of 63.2% on adult animals and attributed this to contact due to their large body size and feeding on vegetation on which the ticks were attached. They also believe that adults and adolescents cattle, sheep and goat were always the preferred host for ticks' infestation than the young animals without any consideration of breeds or species.

Oyewusi, I. K. et al, (2015), in their studies, where cattle entering Nigeria by hoof along a major trans-boundary route were assessed and found infested with a mean tick count of 66.3±35.8 per animal confirming that the trans-boundary areas are points of entry of parasites into the country. 57.7% of the animals had a very high level of tick infestation. Adult ticks identified include Amblyomma spp. (49.6%), Rhipicephalus (sub genus Boophilus) spp. (93.6%), Rhipicephalus spp. (33.9%) and Hyalomma spp. (12.1%). A total of 16,440 ticks were counted in the course of the study. Rhipicephalus (subgenus Boophilus) spp. is the most predominant tick species found in this study. These ticks were found around the ear, dewlap, brisket, udder/scrotum, anal/ genital region, legs and tail region of the animals. It was concluded that cattle entering Nigeria from Burkina Faso, Benin republic, Niger republic, Mali, Togo, and Cote d'ivoire were infested with these adult ticks which also acted as a vector for protozoa and rickettsial parasites. The Nigerian government should establish effective quarantine centres to screen and treat animals entering the country. With irrigation and planting of improved grasses and crops for zero-grazing, more farmers can be encouraged to invest in intensive system of cattle ranging and management.

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