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Epizootiology of Livestock Ectoparasites Within Lagos State Metropolis, Nigeria

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ABSTRACT

Background and Objective: Ectoparasites pose significant health and economic challenges to livestock, leading to weight loss, reduced productivity and vulnerability to infections. This study investigated the epizootiology of ectoparasites within Lagos State Metropolis, Nigeria. The prevalence of ectoparasites, species distribution and management strategies were considered as epizootic indices.

Materials and Methods: The survey was conducted across seven areas. In addition to field collections, visual examination, laboratory identification, questionnaires were administered to livestock herders in order to gain insights. A total of 800 livestock (200 cattle, 300 sheep and 300 goats) were randomly selected and 555 (68.7%) were infested with at least one ectoparasite.

Results: The prevalence of ectoparasites was highest in cattle (100%), followed by sheep (63%) and goats (46%). Tick infestation was the most prevalent in all livestock. Cattle had a prevalence of ticks (85%), lice (6.5%) and mites (8.5%). Of tick infestations, *Rhipicephalus annulatus* was 69% *Amblyomma variegatum* was 16.9% and *Rhipicephalus microplus* was 13.8%. Lice infestations was mainly due to *Linognathus vituli* whereas *Demodex bovis* was the sole mite specie on cattle. Ojo area (38.2%) followed by Agege area (29.4%) had the highest tick prevalence, whilst Ikorodu area had the lowest (12.4%). The prevalence of infestation in sheep and goats was 63% and 46% for ticks, 48.5% and 34% for lice and 11% and 5.5% for mites respectively. For sheep/goats, three tick species were identified: *R. annulatus* (62%) *R. appendiculatus* (23%) and *A. variegatum* (15%). Mushin area had the highest (82.5%) tick infestation. *L. vituli* and *Haematopinus euryternus* lice and *Demodex* mites were also identified. Statistical analysis indicated a significant variation in infestation across the areas and between the livestock. Ojo and Mushin areas had the highest infestation in cattle and small ruminants, respectively. The questionnaires revealed that, 100% of the herders were aware of infestations but often relied on traditional control methods, which were inadequate for prevention. The side-effects reported included weight loss, anemia and loss of productivity. The survey implicated higher infestations in the dry season.

Conclusion: To mitigate the impact of ectoparasites on livestock, continuous and improved surveillance along with integrated management strategies, regular veterinary interventions and educational programs should be implemented.

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INTRODUCTION

Livestock farming constitutes an important sector of the agricultural economy of Nigeria, as it is a source of protein, revenue, income and raw materials in the manufacturing industry. Some of the largest livestock types raised in the country are bovine (cattle), ovine (sheep) and caprine (goats) that are important to both rural and urban economies[1]. Epizootiology is the study of the dynamics of animal diseases at the population or community level, rather than the individual level. It encompasses

both infectious and non-infectious diseases. It examines the epizootic (widespread outbreaks) and enzootic (persistent, low-level presence) patterns of diseases within animal populations[2,3]

Bos taurus (cattle) is hoofed mammals in the family Bovidae and subfamily Bovinae (Bovids). In dairy and beef production, they are mostly reared for high yields. This category of livestock has a high economic and agricultural value for man[1]. The low maintenance costs and high reproductive rates of cattle make them valuable. Cattle milk is a nutritious food source for humans, containing proteins, lipids, carbohydrates, minerals and vitamins[3,4].

Ovis aries (sheep) and *Capra hircus* (goat) belong to the subfamily Caprinae of the family Bovidae. In Nigeria, livestock systems, particularly in arid and semi-arid areas, rely on these small ruminants[4,5]. Sheep are reared for meat and wool, while goats are reared for their meat, milk and hide. Their relatively low maintenance cost and high reproductive rate make them especially valuable for smallholder farmers but they are susceptible to parasitic invasion[5,6].

Ectoparasites are organisms that live on the surface of a bigger host organism and relies on it for food, shelter and survival requirements[6]. They are not only parasites that impact their hosts directly but they may also serve as vectors for diseases[7,8]. Haematophagous arthropods such as lice, mites and ticks are the most important cattle ectoparasites economically. They are often in close contact with grazing ruminants in free-range lands and open pastures. The continuous blood sucking is irritating to livestock causing severe losses in production[9]. These arthropods live on the skin of the host where they grow, nourish and multiply. Ectoparasitic invasion is the main threat to cost-effective production of livestock, as they harm skin and spread diseases between animals[10,11].

As ectoparasites impact livestock, they pose an obstacle to their development and devalue resources that can be derived from them. Heavy parasitism causes skin deformation, a decrease in wool quality and poor yield[12]. Infestations caused by ticks and mites on ruminants result in huge economic losses due to selective slaughtering of the animals to prevent sudden death. Furthermore, infestations are often expensive to treat and prevent. Apart from massive pre-slaughter, skin deformity downgrades the hides and leads to rejection of skins (hides) which is a source of income in Nigeria. These ectoparasites may also transmit pathogens and predispose the ruminants to zoonotic infections[11]. According Leon et al.[13], approximately 1.49 billion cattle worldwide can be potentially infested with a variety of different ectoparasitic fauna.

Urban livestock markets are crucial for understanding ectoparasitic infestations due to their role as convergence points for various livestock. Thus makes them an essential area for assessing epidemiological trends of ectoparasite infestations among livestock populations. In such markets, ectoparasite infestations persist and spread due to poor sanitary conditions, limited veterinary care and transient trade conditions. Estimating the prevalence, abundance and distribution of ectoparasites is critical for identifying high-risk zones and understanding their population dynamics. This study aimed to address these gaps by providing critical insights for effective disease surveillance and implementing effective control and prevention strategies.

MATERIALS AND METHODS

Study area: The study was conducted across selected livestock ranches and markets in seven (7) areas within Lagos Metropolis, which included Agege, Ajeromi, Alimosho, Badagry, Ikorodu, Ojo and Mushin areas. The study period lasted for six months, from July to December, 2024.

Alimosho and Agege areas had only cattle ranches. In 3 areas, herders kept both sheep and goats, with the exception of Ikorodu and Ojo areas where cattle, sheep and goat were kept.

Collection of Ectoparasites: Informed consent was obtained from livestock herders at each area before samples were collected. Random and systematic sampling methods were used to select cattle, sheep and goats across selected locations. For each selected livestock, a thorough physical inspection was conducted to detect the presence of ectoparasites. A pair of forceps and disposable rubber hand gloves were used during the collection process to ensure hygienic handling. The skin and hairy body regions were carefully examined, including the ears, tail, neck, scrotum (for males), mammary glands (for females) and the belly region. Hair was combed against the grain to reveal hidden ectoparasites such as lice and ticks. Ticks and lice were handpicked directly from the livestock using forceps, ensuring that their mouthparts remained intact during removal. Mite scabs, particularly from cattle, were obtained using sterile razor blades to gently scrape the affected skin areas. Since mites are microscopic, the body parts of livestock were scraped and the scabs immediately preserved in 70% ethanol to prevent decomposition and ensure integrity for taxonomic identification. In labeled vials, all collected specimens were transported to the Zoological Research Laboratory, Department of Zoology and Environmental Biology, Lagos State University for proper taxonomic identification.

Examination and identification of ectoparasites: The identification keys of Grubb[6] were used to classify the ectoparasites at the Zoological Research Laboratory, Department of Zoology and Environmental Biology, Lagos State University. Scab samples collected for mite detection, were first incubated in saline solution and examined under an Olympus microscope using the x10 objective lens.

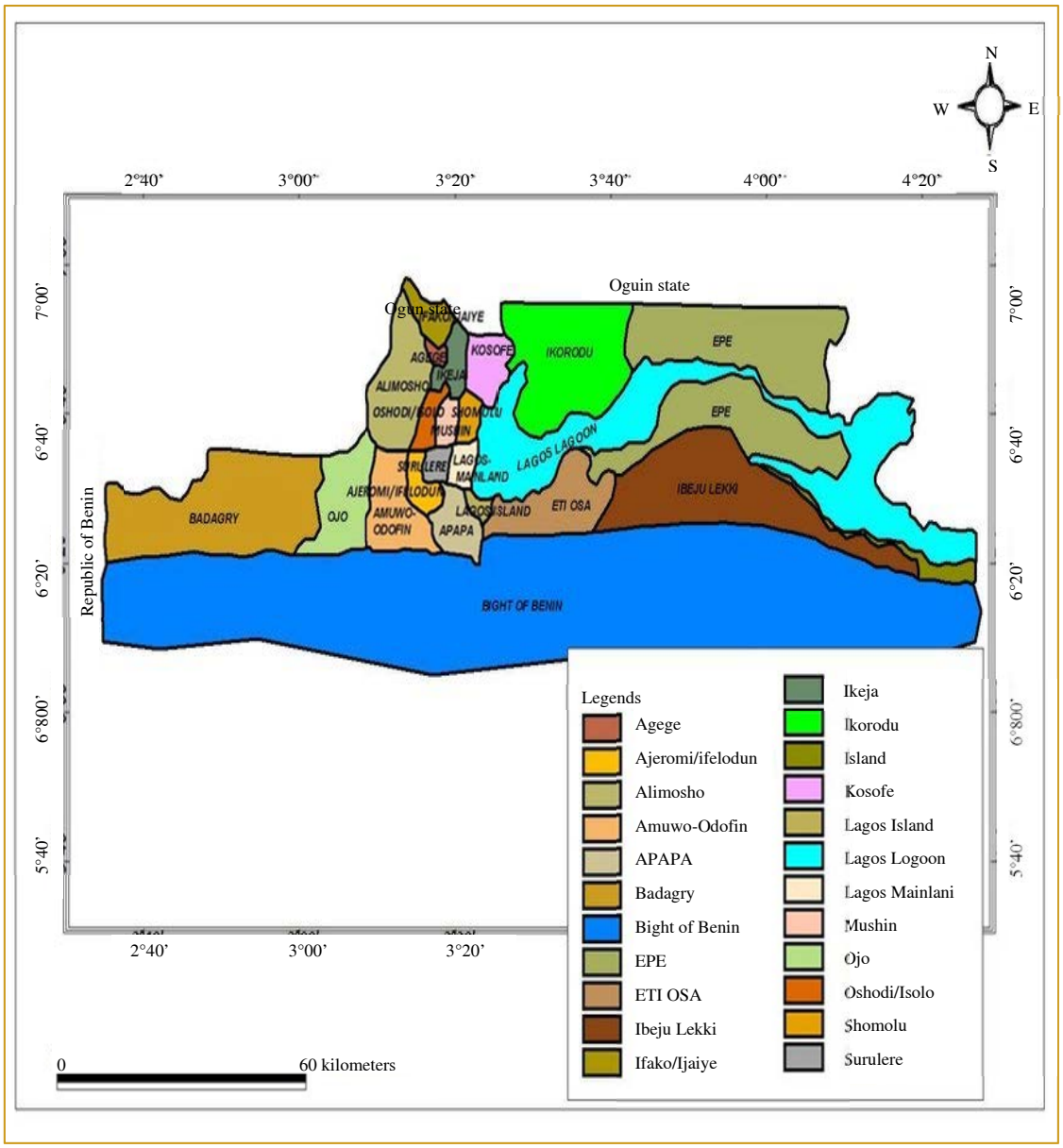

Fig. 1: Map of Lagos State showing the selected areas. Locations and available livestock:
Agege: Oko -Oba (King's farm) Cattle ranch (Cattle only), Alimosho: Onigando Cattle ranch: (Cattle only), Ajeromi: Ajeromi Livestock market (Sheep and Goat), Badagry: Opa Livestock farms (Sheep and Goat), Ikorodu: Main market livestock area (Cattle, Sheep and Goat), Mushin-Olorunsogo Livestock ranch (Sheep and Goat) and Ojo: Alaba- rago (Cattle, Sheep and Goat)

Ticks and lice were placed on sterile glass slides for direct microscopic examination, while a hand lens was employed for the preliminary identification of larger ectoparasites. Each specimen was preserved in properly labeled bottles containing 70% ethanol, indicating the type of ectoparasite and the location where it was collected.

Questionnaire survey: In order to obtain more detailed information on ectoparasite infestation, a structured questionnaire was prepared for livestock herders who were also involved in the rearing and marketing of ruminants. The questionnaire included a respondent data section and questions targeted at capturing the observations of ectoparasite infestations, including the effects of infestation rates on their livestock. In addition, the questionnaire investigated the impacts of ectoparasite-related diseases, as well as common prevention and treatment practices used by the herders/farmers.

The questionnaires were pretested and validated by the supervisor of the study prior to distribution and a pilot survey was carried out. The pilot survey targeted seven herders/farmers per area. Four of them completed the pretested questionnaire, while three were reluctant. In the actual survey, a total of 40 respondents, comprising cattle (15) and sheep/goats (25) herders/farmers participated in the study.

Data analysis: Survey results were presented in tables. The data from the questionnaires were decoded and analyzed. Chi-square (χ^2) test was used to determine the differences between types of ectoparasites isolated, species identification and area of collection. Differences were considered significant at $p<0.05$.

RESULTS

Infestation rates, distribution and intensity of ectoparasites by location: There was an infestation of ticks, lice and mites in all the areas where livestock had at least one type of ectoparasite. Overall, cattle had 100% infestation rate while sheep had 63% and goats 46%. In terms of intensity, cattle carried a disproportionately high burden (61.4%) of ectoparasites, followed by goats with 25%, while sheep had the least 13.5%. The small ruminants seem to have less severe tick infestations (Table 1). In Ojo area, cattle had the highest infestation rates of ticks (38.2%), mites (47%) and lice (69.2%). This was followed by Agege area with tick infestation at 29.4% and mites at 52.9% but lice were not detected. In Alimosho area, tick infestation rate was 20% but mites or lice were not detected. Ikorodu had the lowest tick infestation (12.4%), moderate lice infestation (30.7%) and no mites were detected. Lice were detected on cattle in only two areas, at 78.5% (Table 1).

Among sheep and goats, a total of 355 out of 600 (59.1%) were infested. The highest tick prevalence was found in Mushin area at 82.5%, followed by Ajeromi area at 58.3%. Among the 660 ticks collected, 164 ticks (24.8%) were from Badagry area, which had the highest geometric mean intensity of ticks. Badagry area recorded 100% lice infestation on sheep and goats out of 271 lice collected while Mushin exhibited the highest mean intensity of lice infestation with 81 (38.7%) lice from the area. In contrast, Ajeromi area had a relatively low lice prevalence (10.0%) in sheep and in goats (15.0%). Mites collected was 111 and the prevalence in Ikorodu was 12.5% in sheep and 12.5% in goats but in Ojo area it was 5.0% in sheep and 2.5% in goats (Table 1 and 2). There was a statistically significant difference in ectoparasite infestation rates across the seven areas of Lagos at 5% level of significance ($p<0.05$).

Species distribution and prevalence of ectoparasites: The most prevalent species of tick collected from cattle was *Rhipicephalus annulatus*, accounting for 37 (69%) of the total tick population across the study areas. This was followed by *Amblyomma variegatum* [11 (16.9%)], *Rhipicephalus microplus* [9 (13.8%)] and *Ixodidae scapularis* [8 (12.3%)] in the Ojo area. Similarly, in the Ikorodu area, *Amblyomma variegatum* remained dominant [7 (3.3%)], followed by *Ixodidae scapularis* [5 (2.4%)] and *Rhipicephalus microplus* [4 (1.9%)]. The dominant lice species identified was *Linognathus vituli*, (long snout louse) with 17 (62.9%) in Ojo and 5 (3.84%) in Ikorodu area. *L. ovillus* was another lice species isolated, with 10 (37.0%) in Ojo area and 8 (6.15%) in Ikorodu area. Cattle mites, *Demodex bovis* was recorded in Ojo and Agege areas, with infestation rates of 47% and 52.9%, respectively (Table 1).

In sheep and goats, out of the 660 ticks, *Rhipicephalus annulatus* was 62%, *R.appendiculatus* was 23% and *Amblyloma variegatum* was 15%. Two lice species were identified*: Haematopinus eurysternus* (short snout) at 10.5% and *Linognathus vituli* at 78.5%. *Demodex ovis* and *D.caprae* (25 % each) were the mites identified in sheep and

Table 1: Prevalence of ectoparasites among Livestock with in seven areas of Lagos

	Ticks (%)			Mites (%)			Lice (%)		
Area	Sheep	Goat	Cattle	Sheep	Goat	Cattle	Sheep	Goat	Cattle
Ojo	12(30)	22(55)	65(38.2)	2(5)	1(2.5)	8(47.0)	23(57.5)	12(30)	9(69.2)
Badagry	13(32.5)	12(30)	-	5(12.5)	2(5)	-	32(80)	12(30)	-
Mushin	36(90)	33(82.5)	-	6(15)	0(0)	-	12(30)	16(40)	-
Ikorodu	32(80)	12(30)	21(12.4)	5(12.5)	5(12.5)	0(0.0)	16(40)	15(37.5)	4(30.7)
Alimosho	-	-	34(20)	-	-	0(0.0)	-	-	0(0.0)
Agege	-	-	50(29.4)	-	-	9(52.9)	-	-	0(0.0)
Total	126/200	93/200	170/200	22/200	11/200	17/200	97/200	68/200	13/200
	0(63)	(45.5)	(85)	(11)	(5.5)	(8.5)	(48.5)	(34)	(6.5)

df = 6 , χ^2 = 1.358, p =12.592, $p<0.05$

Table 2: Distribution of ectoparasites collected in small ruminants from five areas

	Infested ruminants					
Area	No of tick (%)	No of tick (%)	No of mite (%)	No of mite (%)	No of lice (%)	No of lice (%)
Ojp	60(50)	157(23.7)	6(5)	12(10.8)	35(87.5)	41(15.1)
Badagry	60(50)	164(24.8)	18(15)	27(24.3)	40(100)	57(21)
Mushin	99(82.5)	131(19.8)	15(12.5)	35(31.5)	27(67.5)	81(29.8)
Ajeromi	70(58.3)	111(16.8)	13(10.8)	16(14.4)	25(62.5)	40(14.7)
Ikorodu	66(55)	97(14.6)	14(11.6)	21(18.9)	30(75)	52(19.1)
Total	355(59.1%)	660	63(10.5%)	111	157(78.5%)	271

df = 4, χ^2 = 3528 , p = 5.991, $p<0.0$ 5

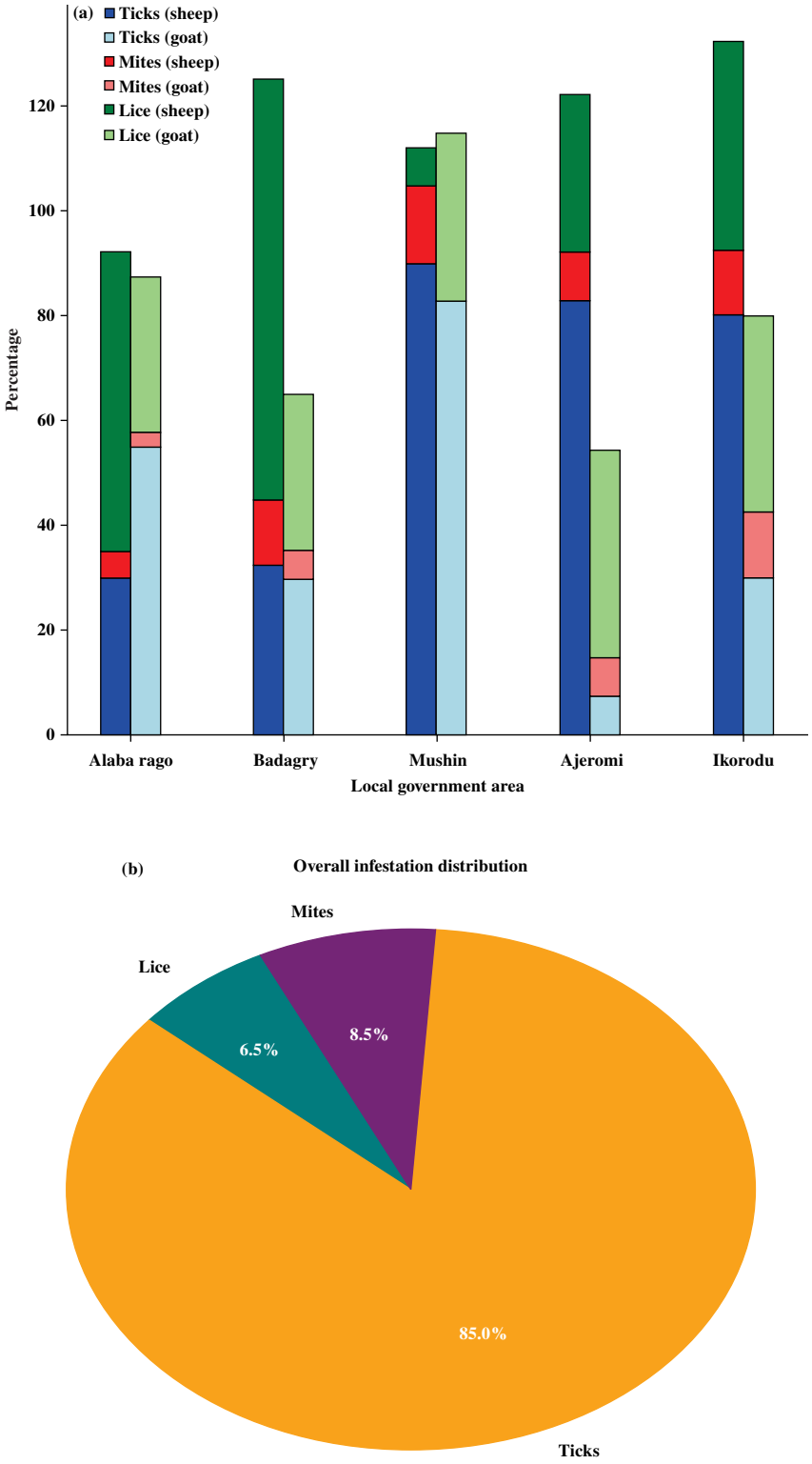

Fig. 2(a,b): Chart visualizing the infestation rates of ticks, mites and lice in sheep and goats across 5 areas and (b) Chart visualizing the overall infestation distribution of ticks, mites and lice in cattle across 4 different areas

goat, respectively. Variations in species distribution were found among livestock types, with highly significant differences ($p<0.05$).

Questionnaire survey results: A total of 40 herders/farmers who participated in the study were aged 35-60 years and were mostly Muslim (98%), while 2% were identified as

Table 3: Perception of herders on ectoparasites of small ruminants (N=25)

Questions	Ojo	Ikorodu	Badagry	Mushin	Ajeromi
No of breeders/sellers surveyed	5	5	5	5	5
Number of goat breed	3	3	3	3	3
Number of sheep breed	4	4	4	4	4
Knowledge-of ectoparasites	Yes	Yes	Yes	Yes	Yes
Knowledge-of-control measures	Yes	Yes	Yes	Yes	Yes
Season-with-high infestation	Dry	Dry	Dry	Dry	Dry
Do ectoparasites cause diseases?	Yes	Yes	Yes	Yes	Yes
Do ectoparasites kill sheep and goats?	Yes	Yes	Yes	Yes	Yes

df = 7, $\chi^2 = 0$, p = 0.05

Table 4: Knowledge of livestock farmers on ectoparasite infestation N= 40

Questions	Responses N (%)
What type of ruminants do you keep?	
Cattle	13 (32.5)
Sheep	05 (12.5)
Goats	05 (12.5)
Sheep and Goats	14 (35)
All of the above	03 (7.5)
df = 4, $\chi^2 = 5.0$, p = 0.17, p>0.05	
What type of cattle breeds did you keep/sell?	
Sokoto Gudali	13 (32.5)
Fulani white	11 (27.5)
Red Bororo	02 (05)
All of the Above	14 (35)
df = 3, $\chi^2 = 5.0$, p = 0.17, p>0.05	
Have you seen any cases of ectoparasite-borne illness in the Bovines?	
Yes	14(35)
No	13(32.5)
Not certain	13(32.5)
df = 2, $\chi^2 = 0.29$, p = 0.87, p>0.05	
Which of the ectoparasite infestation is more prevalent?	
Ticks	28(70)
Mites	01(2.5)
Lice	11 (27.5)
df = 2, $\chi^2 = 24.0$, p = 0.001, p>0.05	
What signs have you observed in bovines infested with ectoparasite? Please select all that apply	
Anaemia	13(32.5)
weight loss	14 (35)
hair loss	10 (25)
skin irritation	11(27.5)
df = 3, $\chi^2 = 5.0$, p = 0.17, p>0.05	
How much of an impact do you think ectoparasite infestation have on ruminant health and productivity	
High impact	15 (37.5)
moderate impact	12(30)
low impact	10(25)
no impact	01(2.5)
df = 3, $\chi^2 = 9.57$, p = 0.023, p>0.05	
During what season of the year is ectoparasite infestation more prevalent	
Rainy season	15(37.5)
dry season	23(57.4)
both seasons	02 (5)
df = 2, $\chi^2 = 0.50$, p = 0.48, p>0.05	

Christians. Of the small ruminant herders, 39 (97.5%), indicated that they sold local breeds such as the West African Dwarf goat, Red Sokoto goat, Borno Red goat, West African Dwarf sheep, Yankasa sheep, Uda sheep and Fulani sheep. Only one respondent (2.5%) reported that they sold an exotic breed.

All respondents (100%) were aware of ectoparasite infestations in the small ruminants. The uniform responses indicated that knowledge and perceptions about ectoparasites were consistent across the areas. There was unanimous awareness of ectoparasites and their control, with identical breed counts across the areas (Table 3).

Among cattle herders, 13 (32.5%) stated that they were cattle herders/farmers, although most also kept small ruminants. However, 05 (12.5%) handled goats or sheep while 3 (7.5%) handled all the three livestock. The most common cattle breed was Sokoto gudali [13 (32.5%)], followed by Fulani white [11 (27.5%)] (Table 4).

A total of 14 (35%) respondents reported ectoparasite-borne diseases to be a threat, 13 (32.5%) considered them moderately prevalent, while 13 (32.5%) were uncertain. However, 28 (70%) farmers/sellers believe ticks as the chief ectoparasite and believe their economic impact is significant. The most recognized symptoms used to identify sick livestock was weight loss [14 (35%)] followed by anaemia [13 (22.5%)]. Others noted additional symptoms such as decreased fertility, reduced meat and milk yield and overall discomfort in cattle. Furthermore, 15 (37.5%) acknowledged the high impact of ectoparasite infestations on livestock health and market value. The cattle herders observed seasonal variations in tick infestation and some linked these changes to climate fluctuations. Most respondents [23 (57.5%)] indicated that ectoparasite infestations were more prevalent during the dry season compared to the wet season [15 (37.5%)]. Regarding control measures, half (50%) of the respondents suggested general prevention practices, including isolating infected livestock (25%) and handpicking ectoparasites due to financial constraints. Only one respondent mentioned pharmaceutical interventions as a treatment method (Table 4).

DISCUSSION

In this study, the overall prevalence of ectoparasite infestation was 68.7%. The prevalence of ectoparasites was 100% in cattle, 63% in sheep and 46% in goats reflecting the growing threat these parasites pose to livestock health and productivity in different areas. This finding is higher than the results of the previous studies which reported 16.7% and 10.0% prevalence of ectoparasites in sheep and goats, respectively in Gwagwalada, Abuja, Nigeria[14,15]. It is also higher than the infestation rates reported in the areas of Anambra state, Nigeria, which were 45.95, 55.1 and 68.1%[16]. These infestation rates contradict with those reported in other parts of the country[16-18].

The results of this work are similar to those of a study conducted in 2008 regarding tick abundance on livestock in Lagos metropolis[9]. However, in that study, tick (*A. variegatum*) and lice (*H. euryternus)* were the most abundant species while mite (*Sarcoptei scabei*) was the only specie identified. According to another survey conducted in 2022[12], ticks was the most prevalent ectoparasite of livestock in Lagos Metropolis. *R.annulatus, A. variegatum* and *R. microplus* were isolated among four other species identified in that study. However, in the present study, only these three species mentioned were identified. In this study, all cattle were infested (100%) with at least one ectoparasite. Body size and surface area of cattle make them more attractive or more accommodating to ectoparasites. Cattle usually graze in more tick-prone areas and receive less frequent treatment than the smaller ruminants. The hair density may also play a role in detecting or harboring parasites[1]. These variations in infestation rates suggest that factors such as geography, climate, animal size, grooming behavior and management practices may significantly influence infestation rates. There were significant differences in infestation rates across the locations. The pattern of infestation is not uniform across all seven areas, suggesting that the risk factors or environmental conditions that favour ectoparasite prevalence are localized. The high tick infestation rates, especially in Ojo (cattle) and Mushin (sheep/goat) are potentially linked to environmental conditions, animal density and the seasonality of ectoparasite prevalence. Among ectoparasites, ticks and lice were the most commonly identified species. *Rhipicephalus annulatus* emerged as the most prevalent tick species in cattle (69%) and in sheep/goats (62%). These results disagree with those of Lorusso et al.[18] who claimed that *Rhipicephalus decoloratus* was the dominant species (41.4%) in cattle in central Nigeria. Differences in geographical location, sample sizes, livestock species and detection techniques likely account for the variations between species and their distribution.

The highest geometric mean intensity of infestation was recorded among ticks, followed by lice. The detected lice species on cattle were primarily *Linognathus vituli* (62.9%) and *L. ovillus* (37.0%) while L. *vituli* was 78.5% in sheep/goat. These findings contradict with those of Tongjura et al.[19] who reported additional species such as *Haematopinus euryternus*, in cattle in Nasarawa state, Nigeria but this louse was detected only in sheep and goats in the present study. Mite (*Demodex bovis*) infestations in cattle was 15.5%. This value is close to those reported by Yacob et al.[20] (13.79%) and Ashenafi and Tibbo[21] (11.78%) but significantly higher (3.54%) than those observed by Ambilo and Melaku[22]. The differences in infestation rates may be attributed to environmental conditions, veterinary service access and husbandry techniques. Like *D. bovis* of cattle, *D. ovis* of sheep and *D. caprae* of goat are host specific and can cause demodectic mange or demodicosis leading to skin problems.

In this study it was noted that ectoparasites prefer to live on the head and neck, abdomen and trunk, tail, pelvis, udder and testes which concur with previous study[23]. It is expected that these body parts would be chosen based on their easier access to capillary blood and more easily penetrable tissue, where attachment and feeding would be easier. Furthermore, in hot weather, ectoparasites tend to gather on the back, shoulders and underbelly of animals[24]. There was a greater susceptibility among juvenile ruminants, emphasizing the need for targeted interventions. However, sheep and cattle were found to be more vulnerable to infestation as compared to goats and this result is consistent with a previous study conducted by Orpin et al.[25]. Sheep possess more behavioral characteristics, including less grooming, scratching and licking which makes them more vulnerable

to infestation[26]. On the contrary, the impediments in agro-climatic zones and species composition of ectoparasites could also have an effect on susceptibility among various species. The high rate of infestation in Ojo and Mushin areas might be associated with ineffective sanitation and massive stocking densities of livestock. Ectoparasites spread more easily in these areas due to overcrowding. However, infestation rates were lowest in Ikorodu area, probably because of the improved livestock management, spacious environment and reduced stocking density. These results indicated that sanitary conditions and density of animals play an important role in the growth and transmission of ectoparasites. It is encouraging that some cattle herders demonstrated awareness of ectoparasite management, often relied upon cultural practices and chemical treatments. This observation aligns with the findings of Abang et al.[26] who noted that 92% of farmers in Cameroon employed cultural methods to control pest. In addition to indicating some awareness, this also highlights the need for enhanced veterinary outreach and training to improve ectoparasite control strategies among livestock herders, farmers and sellers. Use of effective ectoparasiticides to deal with infestations is essential especially where climatic conditions are favorable. Control programs should prioritize cattle, as they are the main reservoirs and risk factor for transmission.

There is no doubt that ticks are the most important ectoparasitic agents in this study and their impact is perceived as serious as most herders and farmers rated ticks as having a "high" impact on their health and productivity. For herd composition, breed choice, visible signs and seasonality, χ^2 values do not exceed the 5% threshold so one cannot rule out random variation. A veterinary professional underscored the severity of ruminant ectoparasite infestations. The veterinarian identified infested animals and contaminated grazing areas as key sources of infection.

CONCLUSION

This epizootic survey clearly indicated a significant prevalence of ectoparasitic infestation among livestock in the study areas. Livestock in the surveyed areas were found to be infested with ticks, mites and lice, posing serious implications for animal health and local economies. The presence of ectoparasites in livestock not only reduces productivity but also increases the risk of zoonotic disease transmission to humans who come into close contact with these animals. Comprehensive control measures for ectoparasitic infestations are urgently need from a veterinary and public health perspective. Insufficient awareness among livestock owners contributed to the persistence and spread of these infestations.

This study recommends the following:

- **State-wide intervention:** A Lagos-wide ectoparasite control program is warranted due to the threat of ectoparasites. Government agencies, policymakers and non-profit organizations should prioritize ectoparasite control by supporting awareness campaigns and subsidizing veterinary care for local farmers and herders.
- **Surveillance and monitoring:** Periodic screening and reporting should be implemented to monitor changes in infestation rates over time. Regular checks and treatment of ruminants and their grazing areas, as well as the implementation of effective hygiene and sanitation practices in animal pens and shelters, are vital to minimize infestations.
- **Capacity building:** Training of farmers and livestock handlers on ectoparasite control, environmental sanitation, rotational grazing hygiene and early detection as well as the importance of good animal husbandry and personal hygiene are essential
- **Veterinary services:** Veterinary outreach should be strengthened in Lagos metropolis, focusing on preventive care and treatment

Finally, high infestations pose risks to both human and animal health. Therefore, further research is necessary to establish the vectorial capacity of the ectoparasites identified in this study, which would clarify their roles in disease transmission and could guide more targeted interventions.

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