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The various practices employed by the herdsmen in the management of streptothricosis were identified. The study was conducted in the three geographical zones of the state (Zones A, B and C) comprising 12 Local Government Areas. Data on cattle population, disease predisposing factors, diseases of economic importance, veterinary, extension and traditional management services were collected using scheduled interviews and structured questionnaires. The percentage of herds for which the traditional management practices are used within zones A, B and C were 26%, 20% and 14% respectively. The proportion of respondents that used veterinary management services in zones A, B and C were 86%, 91% and 83% respectively. Most of the herds employed either one or a combination of these practices concurrently in their herds. The effectiveness of veterinary services was found to be statistically significant ($p > 0.05$) within the three zones of the state.

Introduction

Cattle are of considerable economic importance in the agricultural economy of the derived savanna zones. Much of the land in this area has been found to be suitable for rearing animals by nomadic pastoralists while in cultivated areas cattle are of increasing importance as the advantages of mixed farming are better appreciated (Oduye, 1976).

The effective management of streptothricosis infection within cattle population becomes pertinent due to its adverse effect on meat and milk production. The understanding of its epidemiology within Niger State is of paramount importance owing to the adverse effects of desertification which influences the influx of livestock population from the semi arid regions of Nigeria into the State.

Previous report (Nwude et al., 1980), indicates that current veterinary therapy in Nigeria is suffering from both adulteration and high cost of drugs and that reduced funding for animals disease control programmes is adversely affecting the incidence of some important animal diseases to the detriment of the nation's livestock sub-sector. According to Ibrahim (1984), the easiest and most rational solution to the problem is to develop acceptably effective drugs from reasonably inexpensive sources for use as supplements to commercial drugs and that veterinary traditional medicine provides a shortcut to this end.

Successful use of herbal remedies in modern health care systems is being achieved in China, India and the Soviet Union (Obianwu, 1984). However, in Nigeria very little is being done to exploit traditional medicine as it applies to veterinary practice, even though the integration of traditional remedies may be much easier in veterinary practice than in human medicine practice because of the much importance attached to human life.

Certain diseases are recognized by herdsmen as very difficult to treat and streptothricosis is one of such an example (Nwude et al., 1980). It is in the light of the above that this study seeks to assess the various management practices employed in the treatment of streptothricosis in cattle in Niger State.

Materials and Methods**The Study Area**

Niger State lies between latitude $8^{\circ}00'$ and $11^{\circ}30'N$ and longitude $3^{\circ}20'$ and $7^{\circ}40' E$. The state is bounded by Kogi State in the South, in the South-West by Kwara State, in the South-East by the Federal Capital Territory, in the North-East by Kaduna while in the North, it is bounded by Sokoto and Kebbi States. The total land area of Niger State is estimated at 74,244 sq km.

This study covered 12 Local Government Areas of Niger State, Nigeria located within Guinea Savannah zone of Nigeria. The specific Local Government areas covered in the study include Lavun,

Mokwa, Agaie and Lapai located in Zone A and Suleja, Bosso, Paikoro and Rafi located in Zone B as well as Borgu, Kontogora, Magama and Rijau located in Zone C. The mean annual temperature is about 34°C with the hottest months being from March to April (39°C), and the coldest period (15°C), is between December and January during the severe harmattan. Rainfall varies between 1,100 – 1,500mm and rainy season lasts for 150- 200 days (Mid April to end of October) (RIM 1989). The dry season occurs from late October to early April.

One hundred and five (105), questionnaires were administered to one hundred and five randomly selected livestock farmers residing within a distance of 10km radius. Nine questionnaires were administered per Local Government Area. The questionnaires were administered through personal contact which was facilitated by extension officers of the State Agricultural Development Project and Veterinary health workers in the various Local Government Areas under study. The herds of cattle were also inspected and in some cases clinically examined.

The questionnaires administered were designed to obtain information on common diseases noticed in the area, types of vectors (Ectoparasites), seen, and types of treatment administered (Whether Traditional or Veterinary).

Veterinary services adopt the use of chemical drugs like terramycin long acting (TLA), Penicillin – Streptomycin and acaricides. On the other hand extension services adopt the approach of educating the livestock farmers on preventive and health management practices in the herds in combination with the use of chemical drugs. This is particularly handled by the extension officers of the Niger State Agricultural Development Project (N.S.A.D.P).

The data collected were subjected to descriptive statistical analysis using percentage and analysis of variance for the purposes of drawing adequate scientific explanations.

Table 1.0 Livestock Population in the Three Zones Studied (Based on a 10 km Radius within the Point of Observation)

Zone	Local Government Areas	Livestock Population		
		Cattle	Sheep	Goats
A	Lavun, Mokwa, Agaie, Lapai.	1,254	127	213
B	Suleja, Bosso, Paikoro, Rafi.	1,894	221	321
C	Borgu, Kontagora, Magama, Rijau	4,230	306	388
TOTAL		7,378	654	922

Table 2.0 Comparison of Percentage of Livestock Population in Zones Studied in Relation to Estimated Livestock Population in Niger State

Zone	Item	Types of Livestock		
		Cattle	Sheep	Goats
A	% in Zone	17.0	19.4	23.1
	% in State	0.11	0.02	0.02
B	% in Zone	25.7	33.8	34.8
	% in State	0.16	0.03	0.03
C	% in Zone	57.3	46.8	42.1
	% in State	0.36	0.04	0.04

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Table 3.0 Number of herds in which Prominent Economic Disease Conditions were Encountered.

Types of Diseases	Zone A		Zone B		Zone C	
	*N	**% of Total	N	% of Total	N	% of Total
1. Skin lesions	29	83	26	74	22	63
2. Gastro Intestinal Helminthiasis	26	74	24	69	18	51
3. Trypanosomiasis	22	63	25	71	19	54
4. Foot and Mouth Disease (FMD)	5	14	7	20	10	29
5. Foot Rot	7	20	6	6	12	34
6. Peste de petits ruminants (PPR)	7	20	4	11	5	14

* N = Number of herds disease conditions were encountered

** % Total = % of Total Number of herds disease conditions were encountered

Table 4.0 Number of herds in response to different management practices in the treatment of streptothricosis

Types of Diseases	Zone A		Zone B		Zone C	
	*N	**% of Total	N	% of Total	N	% of Total
1. Traditional treatment methods	9	26	7	20	5	14
2. Veterinary Services	30	86	32	91	29	83
3. Extension Services	24	69	30	86	28	80

* N = Number of herds disease conditions were encountered

** % Total = % of Total Number of herds disease conditions were encountered

Table 5.0 Animal response to three management practices, traditional, Veterinary and Extension

Zone	Management Practices	Number of Animals		Responsiveness as % of Total
		Treated	% Responsive	
A	1. Traditional	15	7	47
	2. Veterinary	126	97	75
	3. Extension	53	10	18
B	1. Traditional	18	4	22
	2. Veterinary	163	89	54
	3. Extension	48	22	45
C	1. Traditional	25	6	24
	2. Veterinary	421	274	65
	3. Extension	38	19	50

Table 6.0 Cost Implication of Three Management Systems, Traditional (1), Veterinary (2) and Extension (3) in the treatment of Streptothricosis.

ZONE A	*HERBS	*KEROSINE	*USED OIL	ENGINE	**TLA	**PEN-STREP	ACARICIDE
Number of animals	12	8	5		85	19	30
Quantity of drug (ml/Litre)	240	20L	10L		5100	1140	150L
Total cost (N)	2,400	1,700	600		35,700	5700	12,00
Quantity of drug	20L	5L	5L		20	20	5L
Cost/animal (N)	200	212	120		1,260	900	400
ZONE B	HERBS	KEROSINE	USED OIL	ENGINE	TLA	PEN-STREP	ACARICIDE
Number of animals	9	4	5		292	106	51
Quantity of drug (ml/litre)	180L	10L	10L		17,520	6,360	255L
Total cost (N)	1,800	850	600		122,	11,600	20,400
Quantity of drug per animal (ml/litre)	20L	2.5L	2L		20	20	5L
Cost/animal (N)	280	212	120		1,260	900	400
ZONE C	HERBS	KEROSINE	USED OIL	ENGINE	TLA	PEN-STREP	ACARICIDE
Number of animals	8	6	6		90	51	32
Quantity of drug (ml/litre)	160L	15L	15L		11,400	3,060	160L
Total cost (N)	1,600	1,260	900		37,800	15,300	12,800
Quantity of drug	20L	5L	5L		20	20	5L
Cost/animal (N)	250	210	150		1260	900	400

* Unknown concentration levels

** Three treatment doses

TLA = Teramycin Long Action

Results and Discussion

Table 1.0, shows the representative livestock distribution physically encountered and the number declared by the respondents based on a 10km radius within the point of observation. This is in agreement with an earlier finding (Adefolalu, 1989), that the greatest concentration of livestock populations was around flat lowland areas with abundant resources such as rivers, earthdams and grazing grounds. However, these tend to favour the proliferation of diseases and parasites. This explains why ticks, which have been implicated in the epizootiology of streptothricosis (Koney and Morrow, 1990), were found to be prevalent in the state particularly during rainy seasons. The cause and spread of streptothricosis in herds studied (Table 3.0), have been traced to the presence of ticks as suggested by the responses received from the respondents that tick bite lesions, serve as entry point for *Dermatophilus congolensis* (Ranaivosen, 1986).

In (Table 2.0), the percentage of cattle in the three zones of this study represents 0.63% of the total cattle population of the state while this was 0.09% each for sheep and goats (Table 2.0). The fact that cattle population outnumbered the small ruminants would suggest that a lot of economic values are derived from cattle production (CBN, 1999).

In Table 3.0 skin lesions showed the highest prevalent rate of 83% in the herds. Clinical examinations and data analyzed confirmed streptothricosis to have the highest occurrence. The outcome of this study confirms an earlier report (Ikpeze, 2005), that an association between tick bite and dermatophilosis has been established in which there is 12% prevalence of infection in Nigeria's estimated 10.8 million cattle.

Management practices and health care education must have influenced the results obtained as confirmed by (Springer, 1990), in which the prevalence of streptothricosis in selected herds under two management conditions was investigated as related to the presence of various factors. Streptothricosis was more prevalent on farms with traditional management compared to that on farms with improved management.

The management practices employed in Table 4.0 for streptothricosis control in cattle are similar to those that have been applied to other diseases in animals and in some cases humans (Obianwu, 1984). Traditional management methods had played a primary role in the control of diseases in domestic animals and this trend has featured in responses and actual observations encountered in this study. Tobacco extract has earlier been found to be effective in the control of cattle tick, *Amblyomma variegatum* (Fajimi, 2003). However, the application of veterinary services was found to have the highest frequency rate of 91% which agrees with the previous report that pharmacotherapy is one of the most important means of controlling animal diseases (Sokomba, 1983). Better responses to veterinary services (Table 4.0), are not unexpected since the efficacy of drugs in the market is always tested. However, the degree of response is low when compared to expected results (Nwude and Ibrahim, 1980). This might be the reasons why some livestock farmers in Table 4.0 imbibed the application of traditional remedies which show the highest frequency of 26%. In addition, lack of existence of veterinary services and high cost of drugs might have had a negative effect on the patronage of conventional drugs. Employment of various traditional concoctions from herbs will continue to feature in the control of ailments within the concept of health management. Herbs such as *Aradichta indica* and *Gutera senegalensis* that continue to feature have proved to be quite effective (Sokomba, 1983; Lamorde, 1990). From the result of previous studies (Fajimi, 2003), there are several constraints on over dependency on chemical control of ticks. These include the development of resistance to conventional acaricides (Beugnet and Chardonnet, 1995), environmental concerns, human safety and residues (Crowe, 1978) as well as research and development costs (Pegram, 2001).

In Table 5.0, animal responses to traditional remedies gave the highest response rate of 47% compared to the veterinary services which have the highest response rate of 75%. It will be observed that the veterinary services which in most cases employ parenteral method of drug administration will produce a better result. This is because the active ingredient contained in the drug is quantifiable and the animals are free to move about undisturbed with the drug acting on them systematically.

Table 6.0, shows that veterinary services have the highest cost unit of treatment per animal. The highest cost of veterinary drugs seen in this study is premised on the fact that streptothricosis is a recurring disease, which is very difficult to eliminate in the herd, as such, three treatment doses of antibiotic are given to ensure full recovery. Although traditional treatment methods based on kerosine

and engine oil used to be relatively cheap, the sharp rises in the cost of oil and its products have rendered the use of these products very expensive. The high cost implication of veterinary services observed agrees with (Nwude and Ibrahim, 1980), that the current veterinary therapy in Nigeria is suffering from both scarcity and high cost of drugs and that reduced funding for animal disease control programmes is likely to influence the incidence of some important animal diseases to the detriment of the nation's livestock sector.

Veterinary and extension concepts were adopted more in urban areas and also areas with greater livestock concentration (Tables 4.0 and 5.0). This may be due to the presence of high quality manpower and facilities that are available to provide the necessary veterinary and extension services. In addition, substantial revenue is being derived from livestock and its products in such areas and this makes these treatment methods affordable.

However, traditional treatment methods gained more grounds in areas of low livestock population particularly in the southern parts of the state where herbs and shrubs are readily available.

Information collated from the various respondents (Table 4.0), and questionnaires analyzed showed that the existing veterinary clinics in the state have not been very effective as anticipated in the control of animal disease conditions presumably because management has been by untrained veterinary personnel. Furthermore, owing to the non-availability of veterinary services in the rural areas coupled with the high cost of drugs, the majority of livestock farmers still adhere to the use of traditional treatment methods as shown in Tables 5.0 and 6.0 respectively.

The analysis of variance indicates that there were no significant differences ($P>0.05$), in the application of traditional and extension services in the management of streptothricosis within the three zones of the state. However, the effectiveness of veterinary services was found to be statistically significant.

Conclusion

The livestock industry in the state has a great future provided input and services are made adequately available to the ever increasing livestock farmers. Therefore, since the majority of the livestock farmers are already aware of the effectiveness of veterinary services, government should make concerted efforts in ensuring that veterinary clinics in the state are equipped with the state of the art facilities and relevant drugs and personnel for effective prevention and management of disease conditions.

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