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RESEARCH COMMUNICATION

SEROLOGICAL EVIDENCE OF BOVINE LEPTOSPIROSIS IN MALAWI

J. G. MYBURGH[1], G. P. STALEY[2] and SANETTE M. VAN DER MERWE [1]

ABSTRACT

MYBURGH, J. G., STALEY, G. P. & VAN DER MERWE, SANETTE M., 1989. Serological evidence of bovine leptospirosis in Malawi. *Onderstepoort Journal of Veterinary Research*, 56, 285–286 (1989)

Two hundred and seventy-five serum samples from cattle in Malawi were tested as a pilot survey for *Leptospira* antibody titres. Fifty-nine (21,4 %) of the animals were positive for leptospirosis, while 35 (12,7 %) animals reacted inconclusively. Titres to L. *hardjo* and *L. pomona* serovars were the most prevalent. Results are also discussed with reference to the areas where samples were collected.

INTRODUCTION

Leptospirosis is a disease of world-wide economic and zoonotic importance (Ellis, 1984). *Leptospira* infections may be the cause of enormous economic losses in the form of abortions, stillbirths, deaths, decreased milk production and infertility (Amatredjo & Campbell, 1975; Faine, 1982; Ellis, 1984). The disease in man may vary from inapparent to severe infections and death (Faine, 1982; Hanson, 1982).

Epidemiological information on leptospirosis in Africa is lacking (Ellis, 1984), however the serological surveys that have been done in Africa, suggest that leptospirosis plays an important role as a pathogenic disease of livestock (Burdin, Froyd & Ashford, 1958; Botes & Garifallou, 1967; Amatredjo *et al.*, 1975; Swanepoel, Blackburn, Lander, Vickers & Lewis, 1975; Herr, Riley, Neser, Roux & De Lange, 1982; Ellis, 1984; Te Brugge & Dreyer, 1985; Feresu, 1987). As far as can be ascertained, there are no records available on the occurrence of leptospirosis in Malawian cattle. The aim of this pilot study was to determine the presence of *Leptospira* antibodies in Malawian cattle.

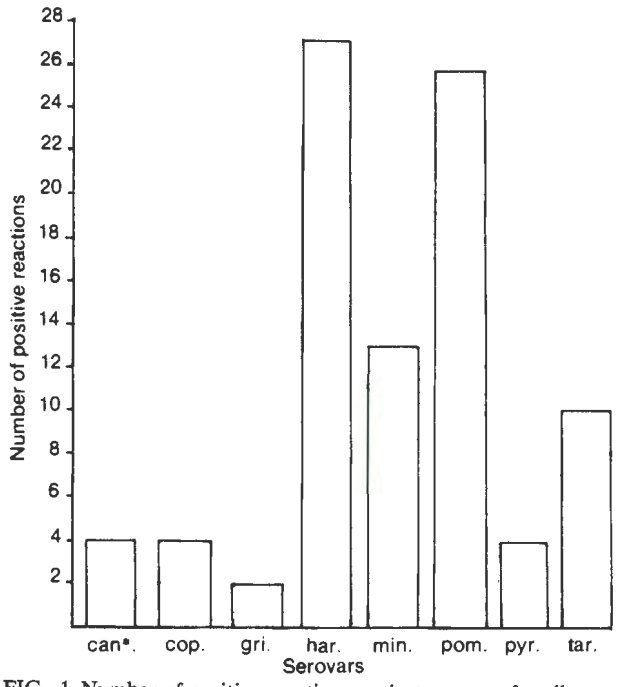

FIG. 1 Number of positive reactions against serovars for all sera tested

*can. = canicola
cop. = copenhageni
gri. = grippotyphosa
har. = hardjo
min. = mini
pom. = pomona
pyr. = pyrogenes
tar. = tarassovi

MATERIALS AND METHODS

Two hundred and seventy-five samples were obtained mostly from abattoirs in Malawi and were collected in vacuum tubes [1] at slaughter. The cattle were predominantly male of at least 18 months of age and originated from throughout the country (Table 1).

Samples were refrigerated at approximately 4 °C for 14 days before being flown to the Republic of South Africa. The serological tests were done at the Veterinary Research Institute, Onderstepoort.

The sera were tested using the microscopic agglutination micro-volume technique (Sulzer & Jones, 1978; Herr, Hunter & De Lange, 1987). The following antigens were used: *canicola, copenhageni* (ictherohaemorrhagiae), *grippotyphosa, hardjo, mini* (szwajizak), *pomona, pyrogenes* and *tarassovi* (hyos).

Antigens were grown on liquid EMJH[2] medium and used between 4–14 days when the growth of the leptospires exceeded 2×10^7 organisms per mℓ (Sulzer & Jones, 1978). The end-point titre was taken as the dilution where 50 % of the organisms, as compared with the negative control, were either absent or visibly agglutinated and where there was a greater degree of agglutination in the immediately preceding lower dilution. A titre of less than 80 was regarded as negative, 80 as inconclusive and 160 or higher as positive.

RESULTS

Fifty nine (21,4 %) of the animals tested, were positive for leptospirosis, while 35 (12,7 %) animals reacted inconclusively (Table 1).

The serum samples were tested against 8 serovars and the total number of positive reactions against these serovars are given in Fig. 1.

Serovars *hardjo* and *pomona* were the most prevalent if the total number of positive reactions are taken into consideration (Fig. 1).

DISCUSSION

The occurrence of positive titres to *Leptospira* organisms in the animals tested, indicate that *Leptos-*

[1] Veterinary Research Institute, Onderstepoort 0110

[2] Faculty of Veterinary Sciene, University of Pretoria, Onderstepoort 0110

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[1] Sterile blood collection tubes manufactured by Radem Laboratory Equipment CC, Wynberg, Sandton.

[2] Difco Laboratories, Detroit Michigan, USA

TABLE 1 Number of animals positive (%), inconclusively (%) and negative for each area

Area	Number of animals			Total
	Positive	Inconclusively	Negative	
Blantyre	2 (10 %)	5 (25 %)	13	20
Chikwawa	2 (9,5 %)	3 (14 %)	16	21
Chitipa	1 (12,5 %)	2 (25 %)	5	8
Dedza	1 (10 %)	0	9	10
Dowa	9 (32 %)	2 (7 %)	17	28
Kasungu	14 (46,5 %)	3 (10 %)	13	30
Lilongwe	8 (38 %)	4 (19 %)	9	21
Mchinji	0	0	1	1
Mwanza	0	0	1	1
Mzimba	5 (8,5 %)	9 (15 %)	46	60
Nsanje	0	1 (7 %)	12	13
Ncheu	2 (12,5 %)	2 (12,5 %)	12	16
Ntchisi	15 (37,5 %)	4 (10 %)	21	40
Rumphi	0	0	1	1
Thyolo	0	0	5	5
Total	59	35	181	275

pira organisms are present and that cattle are frequently exposed to these organisims. Fifty-nine of the 200 animals tested (21,4 %), were positive for leptospirosis. These results suggest that leptospirosis might play an important role as a bovine pathogen in Malawi.

The central region of Malawi (Dowa, Kasungu, Lilongwe and Ntchisi) appears to have the highest prevalence of positive titres to *Leptospira* organisms (Table 1).

The Republic of Malawi is a land-locked central African state, located south of the equator. It is 840 km from north to south, varying in width from 80 to 160 km (MacGregor Hutcheson, 1987). It has a total area of 118 484 km^2, including 24 208 km^2 of inland water and is aligned along the southern continuation of the East African Rift Valley system (MacGregor Hutcheson, 1987). Malawi is a country with a high annual rainfall and a wet environment. Most of Malawi receives an annual rainfall of 760–1 015 mm, but some areas in the higher plateaux experience over 1 525 mm (MacGregor Hutcheson, 1987). Temperature and moisture present, could provide suitable conditions for the survival of *Leptospira* organisms.

Animal husbandry practices where cattle, sheep, goats and pigs roam freely create ideal conditions for direct, intra-species and inter-species transmission. Indirect and direct bovine to bovine transmission is of greatest importance in strains adapted to, and maintained by cattle, e.g. serovar *hardjo* (Ellis, 1984). Strains maintained by other domestic animals may also play a role in infecting cattle, e.g. serovar *pomona* maintained in pigs (Hanson, 1982). Considering the serology results it appears that serovar *pomona* is second only to *hardjo* in prevalence and the role of pigs in the epidemiology of bovine leptospirosis in Malawi, is to be investigated (Fig. 1).

Malawi has a wide range of free-living wild animals and the farm mangement practices and enviromental conditions provide ample opportunity for indirect contact with cattle to occur. Wild animals could play an important role in the epidemiology of bovine leptospirosis, because positive titres to leptospirosis have been reported in several species of game (Krauss, Roettcher, Weiss, Danner & Hübschle, 1986; Hunter, Flamand, Myburgh & Van der Merwe, 1988).

This pilot survey indicates that *Leptospira* infections occur in cattle in Malawi and the possibility therefore exists that it may occur in other species as well as man. Isolation of *Leptospira* organisms from cattle should be attempted.

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