

THE EFFECT OF METROLOGIC FACTORS ON THE SEASONAL DYNAMICS OF CATTLE LEPTOSPIROSIS IN THE SUDAN

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INTRODUCTION

A number of authors (Karaceva 1954, Ananin 1955, Broom 1959, Barbara 1970, Sosov 1974 and Amatredjo et al 1975) confirmed that distribution and spread of leptospiral infection as well as the intensiveness of its epidemiological process depends not only on the presence of the causative agent but to a considerable extent on the effect of climatic conditions and the nature of geographic and ecologic dimensions.

This accounts for the characters of leptospirae themselves and the frequency of infection with rainy weather, open waters, muddy soil, drainage and irrigation systems i.e. the spread and continuous existence of leptospiral infection in one region is directly connected with the amount of rainfall and humidity.

For the above reasons we carried out this study to show the relationship between the rate of infection in animals and the fluctuations of these factors in different climatic zones.

MATERIALS AND METHODS

Serologic tests using the routine microscopic agglutination test (MA) were carried on 1142 cattle sera collected from different climatic zones. Data concerning these different climatic zones were analysed retrospectively from metrologic data (1941-1975). Correlation between positive reactors and the natural conditions was calculated mathematically and statistically using the method of Snedecor (1975).

RESULTS

The results of serologic test using microscopic agglutination test (MA) in the period from March to November, 1978 in comparison to quantity of rainfall, atmospheric temperature and relative humidity all over the country is expressed in the attached histogramme and table No. 1.

From the table and histogramme it is clear that with increase in quantity of rainfall and relative humidity in the rainy season, the percent of positive reactors to

* Extracted from a Ph. D. thesis.

Table 1:
The effect of Metrologic factors to the seasonal dynamic of cattle
Leptospirosis on serocological basis using (MA)

SUBJECT	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	COEFF OF CORR (r)	P
Percent of Cattle reacted to leptospiral antibodies by MA	5.1	9.6	14.7	20.7	21.2	18.9	18.2	13.9	6.8		
Atmospheric temperature in C°	27.3	29.3	30.7	30.6	28.7	27.7	28.6	29.1	26.6	r=0.54	P<0.05
Relative humidity (%)	33.1	32.9	43.3	52.7	67.5	73.8	67.1	54.7	45.1	r=0.82	P<0.01
Quantity of rainfalls (mm)	5.8	14.3	35.1	43.7	99.9	117.6	61.6	32.8	23	r=0.89	P<0.01

Table 2:

Results of serological test for Leptospirosis using microscopic agglutination test (MA).

CLIMATIC ZONES	No of Tested Sera	Leptospires reacted positive against cattle sera in diagnostic titres										Positive Reactors %	The most positive reactors in different climatic zones					
		Leptospira Canicola	Icterohaemorrhagiae	Hebdomadis	Tarassovi	Autumnalis	Celledoni	Pyrogenes	Grippotyphosa	Semeranga	Cynopteri			Bataviae	Australis	Shermani	Pomona	absolute
EQUATORIAL ZONE	80	1	-	7	15	-	-	1	1	-	2	-	-	-	2	29	36.3	16.6
TROPICAL ZONE	531	1	5	51	23	-	-	5	-	1	4	-	-	-	93	17.4	53.1	
SEMI DESERT ZONE	286	1	-	15	6	1	-	2	3	6	-	-	2	-	41	15.3	23.4	
DESERT ZONE	260	-	-	7	4	-	-	-	-	1	-	-	-	-	12	4.6	6.9	
TOTAL	1142	3	5	80	48	1	-	8	4	6	4	2	2	2	175	73.6	100	
PERCENTAGE		1.7	2.8	45.9	27.5	0.57	0	4.5	2.28	3.42	3.99	2.28	1.14	1.14	100			