Mineral Composition of Serum from and *Dermatophilus* Infected Zebu Cattle Under Grazing Conditions in Nigeria

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SUMMARY

SERUM zinc (Zn), copper (Cu), calcium (Ca), magnesium (Mg) and potassium (K) were determined by atomic absorption spectrophotometry in Zebu cattle with dermatophilosis and in normal cattle under grazing conditions during the rainy season in Northern Nigeria. The mean serum Zn, Ca, Mg and K levels in cattle with dermatophilosis were found to be significantly lower than in normal cattle. The serum Zn, Ca and Mg values in Nigerian Zebu cattle during the rainy season appear to be lower than values found by most other workers for cattle found elsewhere. The converse is true for Cu and K. The differences in serum mineral values between Nigerian Zebu cattle and cattle in other countries may be due, among other reasons, to differences in the nutrient quality of the natural forages upon which grazing cattle subsist.

INTRODUCTION

MINERAL elements found in the body of animals are of importance in a number of physiological activities and may be found in either increased or decrease quantities in association with certain diseases (Coles, 1974). Garner (1950) reported that average serum Ca value in osteophagic Zebu cattle was significantly higher, while the average serum Ca value in similar cattle with trypanosomiasis was significantly lower, in comparison with the normal Zebu cattle. Bonomi (1964) suggested that an incidence of

infectious pododermatitis in cattle may be related to a low Zn status of animals and Dermertzis and Mills (1973) found oral Zn therapy as an effective agent in the control of the disease in young bulls.

This paper reports findings on the level and variability of five minerals in serum from Zebu cattle with dermatophilosis and from normal cattle.

MATERIALS AND METHODS

Blood samples of 98 normal Zebu cattle and 43 Zebu cattle with dermatophilosis were obtained from grazing fields during the months of July, August—September and October of 1974. Venous blood was collected in disposable syringes and transferred to deionized glass test tubes. The blood was allowed to clot at room temperature, centrifuged and serum decanted in deionized plastic vials and stored at 4° C prior to analysis. All elements were determined by a Perkin-Elmer Model 290 B atomic absorption spectrophotometer in accordance with the manufacturer's operating manual.

Diagnosis of the disease was based on lesions and demonstration of the presences of *D. congolensis* (Kelley and Bida, 1970)

RESULTS AND DISCUSSION

Serum mineral concentrations are presented in Table 1.

tions and receiving concentrates at the Shika Research Station in Northern Nigeria. The higher Ca value obtained by

TABLE 1
Serum Minerals (mg/l) in Normal and *Dermatophilus* infected Zebu cattle in Nigeria

	Zn		Cu		Ca		Mg		K	
	N	D	N	D	N	D	N	D	N	D
Cattle										
Maximum	1.88	1.28	1.56	1.41	1.58	117	39	28	7.27	298
Minimum	0.72	0.45	0.67	0.77	.83	72	17	14	182	1214
Mean	1.28	0.89	1.05	1.08	97.82	89.84	23.83	20.86	290.0	221.84
Standard Deviation	0.28	0.18	0.16	0.16	11.24	10.61	4.23	2.68	89.36	38.18
Significance	**		NS		**		**		**	

NS = Non Significant Difference ($P < 0.01$)

N = Normal cattle

D = Cattle with dermatophilosis

Figs 1 and 2 show the mean serum mineral variability. A comparison of the levels of serum minerals obtained in this study with those reported by other workers in Africa and in temperate countries is presented in Table 2.

There was no significant difference ($P > 0.05$) in serum Cu between *Dermatophilus* infected cattle and normal animals. The average Zn, Ca, Mg and K levels in Zebu cattle with dermatophilosis were significantly lower ($P > 0.01$) than in normal cattle (Table 1, Figs 1 and 2).

From Table 2 it is evident that the figures for Cu and K in normal Zebus in this study are higher than reported for cattle in Western Nigeria (Oduye and Fansami, 1971), but lower than that for Zebu cattle in Senegal (Friot and Calvet, 1973) and Uganda (Jones, 1943) or for temperate cattle (Underwood, 1971). Anderson (1933) reported a mean Ca value of 114 mg/l for Zebu cattle under grazing condi-

Garner (1950) was from similar cattle from the Vom Livestock Improvement Centre and Laboratory cattle.

The mean Mg level is similar to that for English cattle, but lower than those for similar cattle from the Livestock Improvement Centre and Laboratory cattle at Vom and for similar cattle under grazing conditions in Uganda or in Senegal (Table 2).

The mean Zn level was lower than that for Zebu cattle in Senegal (Friot and Calvet 1973) or for temperate cattle (Underwood, 1971). The importance of reduced serum mineral levels in dermatophilosis is yet to be established.

ACKNOWLEDGEMENTS

The Author is grateful to the Ahmadu Bello University Board of Research for financial support, to Professor B. J. Harris head of the Department of Biological Sciences for his interest in this investigation, and to Dr. Karw Stockinger, Soil Science Section of the Institute for Agricul-

SERUM MINERALS OF ZEBU CATTLE IN NIGERIA

Fig. 2

tural Research, Ahmadu Bello University for use of facilities. The helpful advice of D. I. Saror of the Department of Veterinary Pathology, Ahmadu Bello University is sincerely acknowledged.

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