

ABSTRACT

The objective of this experiment was to obtain information on the status of certain trace minerals of cattle originating from two locations (North and South) in Trinidad. The effects of hair colour, breed, age, sex and carcass weight on tissue mineral concentrations were also evaluated. A total of 73 cattle was sampled, 35 from the North and 38 from the South. Liver tissue was analysed for zinc, copper, manganese, molybdenum and cobalt. Blood serum samples were analysed for zinc, copper, manganese and molybdenum, and hair samples were analysed for zinc, copper and manganese.

Of the livers analysed from cattle in the North, zinc levels were normal, 82.86 percent was copper-deficient, 42.86 percent had liver manganese levels below 10 ug/g (dry basis), molybdenum levels were normal and 2.86 percent was cobalt-deficient.

Of the livers analysed from cattle in the South, zinc levels were normal, 93.37 percent was copper-deficient, 28.95 percent had liver manganese levels below 10 ug/g (dry basis) and all the South cattle had normal levels of liver cobalt. The remaining cattle sampled from both North and South showed liver mineral levels to be either normal or demonstrated a borderline deficiency.

Blood serum mineral levels indicated that both North and South cattle had normal levels of zinc, 91.43 percent of the North cattle was copper-deficient whilst all the South cattle were serum copper-deficient. It was

difficult to arrive at a conclusion for serum manganese levels. Serum molybdenum levels showed that 34.28 and 2.63 percent of the cattle from the North and South, respectively, had serum molybdenum levels below 0.04 ug/100 ml. The remaining cattle sampled from both North and South showed serum mineral levels to be either normal, or demonstrated a borderline deficiency.

Hair zinc levels showed 74.30 and 57.90 percent of North and South cattle, respectively, to be sub-normal. All the cattle originating from the South were deficient in hair copper, whilst 91.43 percent of North cattle was similarly deficient. Hair manganese levels indicated that 68.60 and 49.60 percent of North and South cattle, respectively, were sub-normal in manganese. The remaining cattle sampled from both North and South had either normal or borderline to deficient levels of minerals in the hair.

There were significant differences ($P < .01$) in tissue mineral concentrations which are probably due to the effects of location and season, or a combination of both.

With respect to hair colour, the grey hair colour group had significantly higher levels of zinc in liver and zinc in hair ($P < .01$) than the other 5 hair colour groups. Serum copper levels were significantly higher ($P < .01$) in the white and black hair colour group.

Age effects were observed for manganese and molybdenum in liver, the 49 months and older age group having significantly higher ($P < .05$) levels of liver manganese and molybdenum than the two other younger age groups.

There was no significant difference in tissue mineral concentrations due to sex. A breed effect was observed for liver zinc, hair zinc and liver molybdenum. Liver copper, liver cobalt, serum manganese and hair manganese showed no relationship to hair colour, breed, age and sex of the cattle studied.

There was no significant difference in tissue mineral concentration due to carcass weight when all the South cattle were considered as a single group. However, when the carcass weights were put into age groups, liver molybdenum and hair manganese were significantly different ($P < .05$) for the 25 to 48 months age group whilst liver copper levels were significantly different ($P < .05$) for the carcass weights in the age group 0 to 24 months.

The author wishes to give special recognition to Dr. J. Chang-Yen (U.W.I.) and Dr. J.R. McDowell (University of Florida, Gainesville) without whose assistance, guidance, interest and encouragement this research would not have been completed.

Sincere appreciation is expressed to Mrs. J. Chang-Yen, Mrs. M. Mohammed, Miss F. Mohammed and Mr. H. Kamal for the typing and proofing of this document.

The author is especially grateful to his wife, whose understanding and assistance have made this document possible.