Effects of copper sources and levels on performance, Cu status, ruminal fermentation, metabolism and lipids oxidation in cattle[1]

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INTRODUCTION

Copper is associated with lipid metabolism, becoming very important in reducing cholesterol, and is related with oxidative stability of meat, because it is part of some antioxidant enzymes.

OBJECTIVE

The aim of this study was to determine the supplementation effect of two levels and two copper sources (inorganic and organic), during 84 days, on the performance, liver, muscle and blood Cu concentration, ruminal fermentation, oxidative parameters and lipids and cholesterol metabolism.

MATERIAL AND METHODS

Thirty-five Nelore cattle were allocated in 7 feedlot treatments, as described: 1) C: control diet, without additional Cu supplementation; 2) I10: 10mg Cu/kg DM, as Cu sulphate; 3) I40: 40mg Cu/kg DM, as Cu sulphate; 4) O10: 10mg Cu/kg DM, as Cu proteinate; 5) O40: 40mg Cu/kg DM, as Cu proteinate.

RESULTS

Copper supplementation provided higher Cu liver concentration ($P < 0.05$), with the highest mean observed for the O40 treatment (organic copper).

The highest ceruloplasmin activity ($P < 0.05$) was observed for the I40 treatment. (inorganic copper) .

In general, copper supplementation changed the meat fatty acid profile ($P < 0.05$) with an increase in the proportion of unsaturated fatty acids over saturated fatty acids.

Cu supplementation (treatment I40 and O40) increased SOD (superoxide dismutase) activity related to control treatment ($P < 0.05$), but did not influence the activity of GSH-Px (glutathione peroxidase).

There was no effect of Cu supplementation on blood triglycerides and cholesterol; however, there was a cholesterol reduction in *L. dorsi* muscle related to the control treatment ($P < 0.05$), by reducing GSH concentrations and the SH/GSSG ratio.

CONCLUSIONS

High copper supplementation increased unsaturated fatty acids and decreased the saturated and the cholesterol in *L. dorsi.*