

## THE EFFECT OF COSECURE® SUPPLEMENTATION ON THE COPPER STATUS AND FERTILITY OF GRAZING HOLSTEIN - FRIESIAN DAIRY CATTLE

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There are several studies concerning the relationship between copper status and the amount of molybdenum, sulphur in the diet ( Phillippo et al. 1987; Bremner et al. 1987; Hurley and Doane, 1989; Moeini et al. 1997; Mackenzi et al. 1998). These studies attempted to explore how copper deficiency influences the reproductive performance. The purpose of this study was to examine the effect of copper supplementation by means of a slow release soluble glass bolus (Cosecure) on the trace elements status and fertility of dairy cattle.

Seventeen cows were bolused with two Cosecure boluses (Telsol Ltd.) while the remaining fifteen cows were unbolused (Control). The cattle were grazed at pasture, which has been shown to have high level of molybdenum (2.6 -3.2 mg/kgDM). Blood samples were taken monthly (for six months) to measure trace element status and detailed records of fertility were also maintained. Herbage samples were obtained throughout the grazing period and analysed for mineral Mo, Fe, S and Cu content by Inductive coupled plasma (ICP) and atomic absorption (AA) after wet digestion with nitric acid MAFF(1986). Trace element status was determined by the methods outlined by Mackenzie et al.(1996). Statistical analysis of the results was carried out using student T test and analysis of variance (GLM).

The **result** showed that although in the cows given copper supplementation, the blood copper concentrations increased in comparison to the control groups but all the cows were in the normal range (>12 µmol/l). The blood copper concentrations were lower in both groups at grazing time with marked differences between plasma copper and TCA copper plasma indicating the extent of copper thiomolybdate production. Although the plasma copper, caeruloplasmin and super oxide dismutase activities were higher in treated cows until day 100, and bolused cows had significantly greater plasma copper on day 30 and 60 ( $p<0.05$ ,  $p<0.01$ ) respectively, there were no significant differences between control and treated groups on the whole. The fertility record of the dairy cows produced results similar to the previous experiments (Moeini et al. 1997; Mackenzi et al. 1998) and showed significant difference between the treated and control groups. The conception rate was improved in the cows treated with Cosecure with there being a significant difference ( $p<0.05$ ) in the number of services to conception ( $1.7 \pm 0.2$  vs.  $2.5 \pm 0.3$ ). The calving interval also was significantly shorter in treated cows compared to the controls ( $371 \pm 10$  Vs.  $407 \pm 15$ ).

It can be concluded from this trials that the intakes of molybdenum more than 2.8 mg/kgDM ) and sulphur (> 2 g/kgDM) occurring during grazing time affects the animal copper status and reduces copper availability through the production of thiomolybdate in the body. The effect of Cosecure was likely to be due to the slow release of copper to stop thiomolybdate toxicity.

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