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**SHORT COMMUNICATION**

# Copper supplementation and fertility response in anoestrus buffaloes - A clinical trial

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## ABSTRACT

Clinical trial was conducted on 30 anoestrus buffaloes to study the effect of parenteral copper supplementation on the reproductive performance. Estrus was observed in 90.3 per cent (28/30) animals. Conception occurred in 63.6 per cent (14/22) of buffaloes following subcutaneous administration of 150 mg of copper glycinate.

Key words: Copper, anoestrus, buffaloes, copper glycinate

The anoestrus is a major reproductive problem in buffaloes. Mineral deficiencies are contemplated to be an important cause of infertility in dairy animals. Earlier, a possible relationship between infertility and low copper status was indicated from the studies of Donaldson (1964). Later on, low fertility in cattle was attributed to high level of Mo in diet (Petersen and Waldren 1977, Phillippo *et al.*, 1982). Whitaker (1982), however, opined doubt on the relationship between infertility and subclinical hypocuprosis in dairy cattle. Deficiency of copper conditioned by molybdenum had been confirmed in cattle and buffaloes of Punjab (Singh 1990, Randhawa 1993). The purpose of this study was to conduct a preliminary investigaion on the effect of parenteral copper supplementation on true anoestrus in buffaloes.

The clinical trial was conducted from May to September on 30 buffaloes suffering from protracted true anoestrus diagnosed on the basis of repeated rectal palpation of the genitalia. The infectious cause of infertility was ruled out before the selection of animals. None of the selected buffalo was found to be manifesting any overt clinical sign of copper deficiency. Each buffalo was injected once with suspension of 150 mg copper glycinate subcutaneously and were regularly observed for signs of estrus and thereafter confirmed by rectal palpation of the genitalia. The time interval between treatment and onset of estrus was recorded in 22 buffaloes. Artificial insemination or natural service was provided and pregnancy diagnosis was undertaken in these buffaloes.

Induction of estrus was observed in 90.3 per cent (28/30) buffaloes. The average time interval between treatment and onset of heat was found to be 56.3 ± 9.45 days. Fourteen of the 22 inseminated buffaloes were confirmed to be pregnant. These results were supported by the study of Mahadevan and Zubairy (1969) which showed shortening of intercalving and postpartum anoestrus period following oral supplementation of copper sulphate to the cow herds. Similarly, the conception rate had observed to improve from 53 to 72 per cent with single administration of 400 mg copper glycinate to cows with marginally subnormal blood copper concentration (Hunter 1977). The buffaloes, under present study were maintained on berseem (*Trifolium alexandrium*) fodder during the months of November to May. The analysis of berseem samples for molybdenum, collected from various districts of the Punjab, had revealed that 15.4 to 42.9 per cent were found to contain toxic level of Mo (≥ 10 ppm) (Nayyar *et al.*, 1977). A recent study showed that copper : molybdenum ratio in the berseem was 1:45:1 (Randhawa 1993) whereas normal ratio should be wider than 4:1 (Radostits *et al.*, 1994). Phillippo *et al.* (1986) had observed that high dietary molybdenum reduced conception rate in cow heifers.

Therefore, this dose response trial appeared to suggest that hypocuprosis due to low copper : molybdenum ratio was the possible cause of anoestrus in these animals. Homse (1981) had also ascribed silent estrus and anoestrus due to molybdenosis induced hypocuprosis in cow heifers.

The conception rate was, however, found to be lower (63.6%, 14/22). Clinical trials by Donaldson (1964) had also shown that conception rate gradually increased to 64 per cent following one dose of 400 mg of copper glycinate; to 74 per

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cent after two ; to 93 per cent following third injection of 400 mg of copper glycinate to copper deficient cows in comparison to 42, 56 and 83 per cent respectively in the control group. Therefore, it was possible that although parenteral administration of copper glycinate induced estrus in 90.3 per cent buffaloes, but single administration of copper glycinate was probably not sufficient to proportionately increase the conception rate. Moreover, conception rate is governed by a myriad of factors viz. time of insemination, hormonal imbalance and stress factors which were not monitored in the present study.

It is suggested that more controlled studies on the relationship between copper deficiency and reproductive endocrine profile, before and after treatment, should be conducted to precisely define the interaction between copper and reproductive performance.

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