

# Effect of Copper Supplementation and Vaccination on Cellular Immune Response in Growing Beef Calves

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## Abstract

Investigators have evaluated the effect of stress on copper status of the beef cow using parameters such as weight gain, feed intake and body temperature. Changes in neutrophil, T-lymphocyte and SOD activity in the copper-deficient small ruminant have also been studied to help define the relationship between copper status and immune function in the ruminant animal. The bovine monocyte, is an integral part of the defense mechanism and it has been suggested that copper deficiency can alter monocyte function. Therefore, could dietary copper supplementation alter the bovine monocyte cells immune responsiveness to management stressors?

This study was designed to determine the effects of dietary copper (Cu) supplementation and vaccination on the Cu status and monocyte function in growing beef calves. Fifty-four weaned calves (initial wt 275 kg) were randomly assigned to one of three treatments: 1) Control = basal diet (corn si-

lage + SBM); 2) Basal + Cu-Lysine (Cu-Ly); 3) Basal + Cu-Sulfate (CuSO<sub>4</sub>). Based on DM intake of 6.2 kg/hd/day average daily intake of Cu for treatment groups was 43, 97 and 104 mg, respectively. Twelve calves from each treatment group were vaccinated with *Brucella abortus* Strain 19. Blood samples were obtained 3-5 days post vaccination. Peripheral monocytes were isolated and function was assessed by measuring oxidative burst and phagocytic response to cytoctasin B. Calves supplemented with Cu-Ly had increased (P<0.05) plasma Cu concentrations and monocyte phagocytic activity over control calves. Oxidative burst measured on monocytes from Cu-Ly supplemented calves were increased (P<0.10) compared to the control group. Vaccinated calves had a higher (P<0.10) phagocytosis and oxidative burst response to stimulation compared to non-vaccinated calves. These results indicate that Cu supplementation as a mineral amino chelate (Cu-Ly) enhances monocyte cell oxidative burst and phagocytic activity in growing beef calves.

# A Comparative Study of Tilmicosin and Long-acting Oxytetracycline in the Treatment of Calfhood Respiratory Disease

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## Abstract

The therapeutic efficacy of two long-acting antibiotics was investigated in the treatment of respiratory disease of young female dairy calves less than 90 days of age. Five farms with a previously recognized problem of calfhood respiratory disease were used in the study. Weekly clinical examinations were conducted by a veterinary clinician. A scoring system was utilized to quantify the severity of the respiratory disorder.

At the time of diagnosis, a transtracheal wash was performed on all affected calves. Cases were followed for 3 days after diagnosis of the condition to study the short-term consequences of treatment. Growth rates were monitored over the length of the study to examine the potential detrimental effects of respiratory disease on growth.

The differences in treatment response between the two antibiotics and the effect on growth rates will be discussed in the presentation.

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Editor's note: The results will be published in the next issue of *The Bovine Practitioner* in September, 1995.