Effect of trace minerals on the development of bacterial chondronecrosis with osteomyelitis in poultry


Bacterial Chondronecrosis with Osteomyelitis (BCO) is one of the most common forms of lameness in poultry. It is associated with opportunistic bacterial infections in the proximal long bones and gut barrier failure. Chelated trace minerals have been shown to improve bone strength and gut health, therefore we hypothesize that MINTREX®, the chelated trace minerals, can improve bone structural integrity and gut barrier function thereby decreasing bacteria leakage from the gut into the bone and reducing BCO lesions. A wire flooring model was used to test the efficacy of MINTREX® in reducing BCO lesions in broilers. Ross 308 male broiler chicks were assigned to 3 treatments with 2 pens per treatment: (1) ITM (Zn:Cu:Mn=100:125:90), (2) low MINTREX® (Zn:Cu:Mn=32:8:32); (3) moderate MINTREX® (Zn:Cu:Mn=64:16:64). Compared to ITM, low and moderate levels of MINTREX® reduced the incidence of tibial head necrosis in day14 non-lame birds (p<0.05); moderate levels of MINTREX® reduced the incidence of femoral lesions in all lame birds (p<0.05) and day55 non-lame birds (p<0.05). The impact of MINTREX® on BCO lesions in broilers was also tested in a commercial farm. In this trial, Hubbard x Cobb 500 chicks were assigned to 2 treatments with 4 houses per treatment: (1) ITM (Zn:Cu:Mn=100:125:100); (2) MINTREX® (Zn:Cu:Mn=50:25:50). Lame birds had more severe femoral (p=0.039) and tibial head lesions (p=0.015) than non-lame birds. MINTREX® increased tibial diameter (p=0.0023), reduced tibial lesion scores (p=0.087) and the incidence of severe femoral (p=0.11) and tibial head necrosis (p=0.12) compared to ITM. Taken together, MINTREX® improved femoral and/or tibial head lesions in broilers reared on wire flooring and on litter, which suggests that MINTREX® may be effective in reducing BCO in poultry.

Key words: Bacterial Chondronecrosis with Osteomyelitis; lameness; femoral head necrosis; tibial head necrosis; chelated trace minerals