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Comparison of the effects of form and level of use of manganese, zinc and copper from mineral and organic sources (imported and produced in Iran) on performance, immune response and tibia characteristics of broilers

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Abstract

This research was conducted to investigate the effects of resources and levels manganese, zinc and copper on performance, carcass property, some blood variables, and immune response and tibia characteristics of broilers. Four hundred eighty the chickes commercial Cobb 500 hybrid, were randomly distributed in pens. This experiment was done in 3×2 factorial arrangement in a completely randomized design comprising various sources of manganese, zinc and copper (Sulfate,organic to imported and Irnanian) and levels (100, 50% requirement). Records of performance traits (weight gain, feed intake and feed conversion ratio) were performed and traits related to immune response, blood parameters and tibia characteristics were measured. The results showed that the type of mineral source did not affect the performance of broiler. The livability percentage was influenced by the type of sources of manganese, zinc and copper elements, and imported and Iranian organic types had the highest livability percentage (P< 0/01). Breast percentage appeared highest with organic of import form (P< 0/03). Response to sheep's red blood cell (SRBC) was influenced by the type of sources of manganese, zinc and copper elements, and Iranian organic types had the highest amount (P < 0/001). The smallest percentage of tibia ash was obtained in the import organic form of manganese, zinc and copper (P< 0/01). In addition, the results showed that weight gain was affected by different levels of minerals (P <0.01), and 100% treatment had the highest weight. The effect of different levels of mineral supplementation on the feed conversion ratio was significant (P <0.002) and 100% treatment had the lowest feed conversion ratio. The production index was affected by different levels of minerals (P <0.01) and the treatment was 100% higher. Usage of 50% level of manganese, zinc and copper caused the most response to sheep's red blood cell (P< 0/05). Also, for cellular immunity, skin responses to dinitrochlorobenzene were affected by various levels of Mn, Zn and Cu (P <0.01) and 50% treatment had reaction higher. According to the results of this experiment, the 100 % level of need for manganese, zinc and copper, regardless of source, had positive effects for growth performance and 50% need on immune system..

The organic form of the three elements manganese, zinc and copper produced in Iran, in addition to meeting the needs of broilers for these elements, improved the immune response in broilers and can be a good alternative to the form of sulfate and imported organic.
Keywords: Manganese, Zinc, Copper, Broiler, Organic Mineral, Performance, Immune Response