

## EFFECT OF ADDITION OF IRON AND COPPER ELEMENTS ON SOME BLOOD AND IMMUNE TRAITS OF BROILERS

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**ABSTRACT :** This study was conducted to determine the effect of different levels of iron and copper in drinking water on some productive, immunological and physiological-characters of broiler chickens. 405 one day old of broiler chicks Ross 308 were used and randomly distributed to nine treatments by 45 chicks per treatment with three replicates (15 chicks per replicate) in the batteries containing the cage dimensions of 1.5 × 1.0 m. The treatments were as follows: T<sub>1</sub>: control treatment without addition. T<sub>2</sub>: added 150 ppm iron powder/ liter of drinking water. T<sub>3</sub>: Added 200 ppm iron powder/ liter of drinking water. T<sub>4</sub>: Added 25 ppm copper powder/ liter of drinking water. T<sub>5</sub>: Added 50 ppm copper powder/ liter of drinking water. T<sub>6</sub>: Added a mixture (Fe150 ppm + Cu 25 ppm) / liter of drinking water. T<sub>7</sub>: Added a mixture (Fe150 ppm + Cu 50 ppm) / liter of drinking water. T<sub>8</sub>: Added a mixture (Fe 200ppm + Cu 25ppm) / liter of drinking water. T<sub>9</sub>: Added a mixture (Fe 200 ppm + Cu50ppm) / liter of drinking water. The results showed that as significant increase in ( $p \leq 0.05$ ) cellular immunity and volumetric antibodies against Newcastle virus (ELISA) as well as in the relative weight of fabricia gland and fabricia guide to bird population Iron and copper (mixed or separated) supplementation powder dissolved in drinking water compared to control treatment. Lower of glucose, cholesterol, triglyceride, whereas packed cell volume (P.C.V.), hemoglobin concentrations and ALP activity were significantly increased in blood plasma as compared with control group.

**Key words :** Iron, copper, elements in some traits, blood and immune, broilers.

### INTRODUCTION

Chicken meat is one of the most important sources of animal protein because it contains important amino acids as well as unsaturated fatty acids that reduce blood cholesterol (Richard *et al*, 2018). The demand for poultry meat has increased globally, with world poultry meat production for 2013 (84.6 million tons of meat), with the share of poultry meat accounting for 33% of global meat demand (FAO, 2017). The cost of chicken feed represents the largest weight on the breeder, accounting for more than 65% of the cost, while maximizing the use of feedstocks in local markets that must contain all essential nutrients needed by birds (Suttel, 2010). The addition of mineral elements is a necessity for the growth of the chicken, where it shares the physiological and biological processes of the digestive system of the poultry. It also participates as an enzyme catalyst or coenzyme. It has an effect on the central metabolism of food and in the secretion of hormones (Wang *et al*, 2007), the elements that are needed in very small quantities are measured as part of a million and are called rare mineral elements. These rare elements are essential ingredients in the composition of the bush such as iron, copper,

chromium, etc. (NRC, 1994). Despite its low percentage of the components of the bush, its effect on the productive and physiological performance of animals in general and poultry in particular (Bulbul, 2008). Copper is a rare metal element and has many advantages. It has immunological properties and a very large impact on the bird's immune system and is involved in iron metabolism and in the synthesis of different tissues (Taylan *et al*, 2011). Iron has an important role to play through the transfer of oxygen in the blood to tissue, a key component of hemoglobin in the blood and myoblastic in the muscle cells necessary for the function of these cells, as well as contributes to the formation of cytochrome enzymes in all the cells of the body of the fly works to transfer electrons to oxygen A process called oxidative phosphorylation (Bao *et al*, 2007). The study aims to know the effect of addition of iron and copper elements and their mixture in some blood and immune traits of broilers.

### MATERIALS AND METHODS

This experiment was conducted in the Poultry Field, the Research Station and Agricultural Experiments, Agriculture College, Al-Muthanna University from 5/10/2018 to 10/11/2018. A total of 405 one day old Ross 308