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Effect of different level of iron on performance of body weight and gain in weight in broiler

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Abstract
The purpose of this study was to investigate the effects of iron requirement in growth performance in commercial broiler. A total forty five day old broiler chick of same hatch procured and randomly divided in to three groups. Battery type of cages system consists of three chickens in each to provide recommended floor space 0.75 ft in cages per broiler. T_0 control (ration with out of supplement) T_1 ration supplemented with 60mg iron, T_2 ration supplemented with 80 mg iron T_3 ration supplemented with 100mg iron T_4 ration supplemented with 120mg iron. The mean body weight of chicks in different treatments T_0, T_1, T_2, T_3, and T_4 were 48.0gm, 46.0gm, 45.33gm, 44.00gm, and 42.67gm respectively and they were non-significant effect. The mean body weight of chick at five week of age were T_0 1182.67gm, T_1 1171.33gm, T_2 1145.33, T_3 1140.00gm and T_4 1074.67gm.and the mean of gain in weight of broiler at five week of age were T_0 307.33gm, T_1 290.00gm, T_2 286.00gm, T_3 256.67gm and T_4 254.00gm respectively they were non significantly effect to each other.

Keywords: Performance of body, weight in broiler

Introduction
Iron (Fe) is an essential trace element for broiler growth, which has many functions, e.g. in energy metabolism, neurotransmitter synthesis, and phagocyte antimicrobial activity, as well as in the synthesis of DNA, collagen, and bile acids (Brock 1994) [2]. According to NRC (1994), a level of 80 mg Fe/kg dry matter has been recommended in the diet for broiler chickens. To allow the bird to reach its genetic growth potential, it is a common way to add Fe in diet, and Fe is traditionally supplied in the form of sulfates. Iron is an essential mineral for animal growth and development because it takes part in an array of biochemical processes vital in maintaining normal cellular function. Biochemical processes involved include electron transport (cytochromes and iron–sulphur proteins), handing of molecular oxygen (peroxidase and catalase), oxygen transport and storage (haemoglobin and myoglobin) porphyrin metabolism, collagen synthesis, lymphocyte and granulocyte function and neurotransmitter anabolism and catabolism (McDowell 2003) [9]. Iron is vital for almost all living organisms by participating in a wide range of metabolic processes. Despite its key role, iron deficiency in humans is common worldwide, often leading to significant health issues within the population. Ma *et al*. (2012) [8] reported that addition of Fe-Gly improved the growth performance, Fe tissue storage, and antioxidant status of broiler chickens. Some previous studies revealed that Fe-Gly at an appropriate dosage improved growth performance, hematological and immunological characteristics, Fe tissue storage, and antioxidant enzyme activity in weanling pigs (Ji *et al*. 2007, 2009) [6, 7]. Hence the main objectives were to investigate the effect of different level of iron on performance in body weight and gain in weight in commercial broiler.

Material and Method
A total forty five day old broiler chick of same hatch procured and randomly divided in to three groups and housed in battery type of cages consisting of three chickens in each to provide recommended floor space 0.75 ft in cages per broiler. T_0 control (ration with out of supplement) T_1 ration supplemented with 60mg iron, T_2 ration supplemented with 80 mg iron T_3 ration supplemented with 100mg iron T_4 ration supplemented with 120mg iron The birds were reared in battery type cages under standard management practices from day old to five weeks of age. Iron was supplemented as per dietary regime of treatments. Broiler starter ration containing CP: 22% and ME: 2900K.Cal/kg feed was fed up to three weeks and broiler

finisher ration contain CP: 19% AND me: 3000k. Cal/K. feed up to five weeks. The ration was fed ad libitum to the birds. Initial weight of each chick was recorded on arrival and then weekly to obtain the growth rate. The feed consumption was also recorded weekly to determine the feed conversion ratio. The data on various parameters were recorded, tabulated, and statistically and analysed using analysis of variances (ANOVA) techniques as per Snedecar and Cocharan (1994).

Result Discussion

A) Average weekly body weight of broilers

The data regarding body weight of the chicks randomly distributed into control T_0 and four different treatments T_1, T_2, T_3 and T_4 were observed weekly. At first week of age the highest body weight of broiler was recorded in T_4 (136.00g) fallowed by T_3 (136.00g), T_1 (136.00g), T_2 (126.67g) and T_0 (122.00g) Second weeks of age the highest body weight of broiler was recorded in T_1 (326.67g) followed by T_3 (320.00). T_4 (310.67g), T_2 (300.00g) and T_0 (288.67g). Third weeks of age the highest body weight of broiler were recorded in T_1 (639.33g) Fallowed by T_3 (571.33g), T_4 (569.33g), T_2 (551.33g) and T_0 (549.33g). At fourth weeks of age the highest body weight of broilers were recorded in T_1 (928.67g) followed by T_4 (881.33g), T_3 (854.00g), T_2 (838.00g) and T_0 (818.00g). At five weeks of age the highest body weight of broiler were recorded in T_1 (1182.67g) fallowed by T_2 (1171.33g) T_3 (1145.33g) T_4 (1140.00g) and T_0 (1074.67g).

From the study of data on weekly body weight of broiler may be noted that body weight of broilers irrespective of treatments at one to five week of age were 131.53, 309.60, 576.73, 864.80 and 1143.80g respectively. And the differences in these were significant, indicating thereby a significant effect of age on the body weight of broilers in all treatments. The result was expected because under normal condition the increase of body weight with the intake of feed is what one would expect with the increase in age of broiler. When treatment wise body weight of broilers were recorded at gram were found highest in T_1 (642.67g) and followed by T_3 (616.00g), T_4 (602.00g), T_2 (590.00g) and T_0 (572.80g). The different in these values of treatment were also found significant, indicating thereby a significant effect of treatment on body weight of broilers.

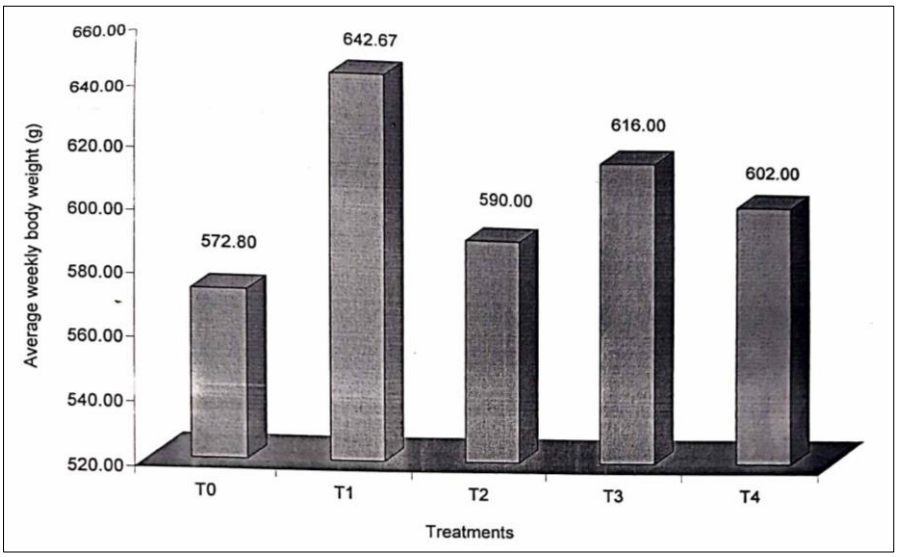

Fig 1: average weekly (g) of broilers in four different treatments with different levels of iron.

B) Average weekly gain in weight of broilers of different treatments

The data regarding the gain in weight of chicken randomly distributed into control (T_0) and four different treatments (T_1, T_2, T_3, and T_4). The following observation were at one week of age the highest gain in weight per broiler were recorded in T_1 (92.00g) fallowed by T_3 (90.67g), T_4 (88.00g), T_2 (80.67g) and T_0 (79.33g). Two weeks of age the highest gain in weight per broiler were recorded in T_1 (190.67g) fallowed by T_3 (184.00g), T_0 (178.00g), T_4 (174.67g) and T_2 (162.00g) and three weeks of age T_1 (312.67g) fallowed by T_2 (262.67g), T_4 (262.67g), T_3 (251.33g) and T_0 (249.33g). At four weeks of age the highest gain in weight per of broiler was recorded in T_2 (310.00g) followed by T_1 (289.33g), T_4 (286.67g), T_3 (284.67g) and T_0 (268.67g) and five week of age T_2 (307.33g) fallowed by T_3 (290.00g), T_4 (286.00g) T_0 (256.67g) and T_1 (254.00g)

From the perusal of data on weekly gain in weight of chicks per broiler may be noted that gain in weight per broiler, irrespective of treatment at first to fifth week of age was 86.33g, 178.27g, 267.53g, 288.67g, and 283.27g, respectively and the different in these were non- significant, indicating thereby significant effect of age on the gain in weight of broiler in all treatment the result were expected because under normal phenomenon. With increase the age, weight gain is also increase and this is what are world expected. When the treatment were recorded gain in weight per broiler was observed T_3 (228.67) followed by T_1 (227.73g), T_2 (219.87g), T_4 (218.40g) and T_0 (206.40g). However their value gain in weight per broiler did not differ significantly being a part.

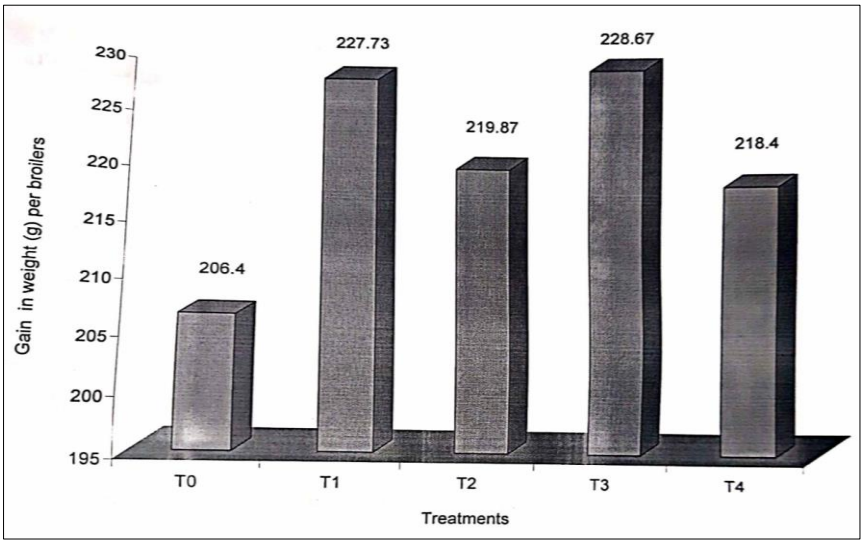

Fig 2: average weekly gain in weight of broilers on diets supplemented with different levels of iron

Conclusion

It may be concluded that there was a beneficial effect of iron supplementation in diet of broiler on body weight and gain in weight. Among those treatments T_1 (60mg iron) has the highest body weight in broiler and T_3 (80mg iron) has the highest gain in weight in broiler within five week of age.

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