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Response of Some Productive Traits of Broiler Chickens to Magnetic Water

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Abstract: Magnetic drinking water (MW) technology has recently been found many advantages, in particular on poultry performance. This study examined the effect of MW on some productive traits of broiler chickens during 1-42 days old. A total of 300 day-old unsexed broiler chicks (Cobb-500) were randomly assigned into 4 treatments of 5 replicates each (20 birds/replicate). Birds were housed in cages. Treatments T1, T2 and T3 means that birds received MW which being passed by magnetizer device (500 gause) with speeds 5, 10 and 15 min respectively to obtain 10 letters MW, whereas T4 (control) received tap water. Results of studied traits (body weight, weight gain, feed intake, feed conversion ratio, mortality, viability and production index) generally exhibited no significant differences between MW treatments (T1, T2 and T3) and T4. Despite of the fluctuation in results, however MW treatments revealed their superiority on T4, in particular T3.

Key words: Magnetic water, broiler chicken, production traits

INTRODUCTION

Using water magnetization has recently raised in different fields as medical, engineering and agriculture, in particular in plant, animal and poultry production (Helal, 2002), all that lead to change the functions of organism, which affect each other (Alhassani, 2000). Water magnetization changes water properties which becomes more energized, active, soft and high pH toward slight alkaline and free of germs (Mg-Therapy, 2000). Data on changes of biological properties of natural water after being magnetized resulted in the development of a method that included providing magnetic drinking water for poultry. Despite, lack of information in this field a few researches have been done and found that using magnetic drinking water for chickens resulted in shortening of fattening period of broiler chickens, an increase in growth rate by 5-7%, improving meat quality flavor and tenderness (Rona, 2004), a decrease of mortality and diseases (Wasef, 1996), as well as a decrease in feed consumption and an improve in feed conversion ratio (SagBaug, 2003). The present study examined the hypothesis that the effect of magnetized drinking water by 500 gause and passed by magnetizer device with different speed flow upon some productive traits of broiler chickens.

MATERIALS AND METHODS

This experiment was conducted at poultry farm, Bakraju station, animal resources department, college of agriculture, university of Sulimanya for period 7/11/2006-19/12/2006. Three hundred, one day old, unsexed Cobb-500 chicks were used and allocated into 4 treatment groups (5 replicates each), placed inside cages, 1 M^2 area each and one M height above floor. Magnetizer device assembled and made of United Arab Emirates was used. Magnetic drinking water by 500 gause power with different speed flow was offered for birds as follow: treatments T1, T2 and T3 means that birds received magnetic water which being passed by magnetizer device with speeds 5, 10, 15 min respectively to obtain 10 litter magnetic water, whereas treatment T4 received normal tap water (control group). All birds were fed conventional starter, grower and finisher diets for 21, 35 and 42 days old respectively. All routine works were followed in birds management such as lighting, temperature, ventilation and vaccination programs. Body weight, weight gain, feed intake, feed conversion ratio, mortality and viability were measured according to Alfayad and Naji (1989). Complete randomized design was used for statistical analysis and the comparison of the means according to Duncan multiple range test (Duncan, 1955) using statistical analysis system (SAS, 1998).

RESULTS AND DISCUSSION

Table 1 exhibited that T1 and T4 significantly ($p \leq 0.05$) surpassed T2 and T3 on 2nd week of age in body weight, as well as a significant ($p \leq 0.05$) increase in weight gain was noticed in T4 for T3 and T3 for T2 on 2nd and 3rd week of age respectively (Table 2). The significant differences in both above traits were disappeared among all treatments on 4, 5 and 6th week old (Table 1 and 2). Feed intake significantly ($p \leq 0.05$) increased in T2 for T4 (control) on 1 and 4th week old, whereas no significant differences were among 4 treatments on 5 and 6 week old (Table 3). Feed conversion ratio had no significant ($p \geq 0.05$) difference among all four treatments for entire weeks of study (Table 4). Final feed intake, body weight, weight gain, feed conversion ratio, mortality and viability and

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Table 1: Effect of magnetized water on live body weight (g) (mean±SE) at different ages of Cobb-500 broiler chickens

		Age (week)					
Treatments	Weight at hatch	1	2	3	4	5	6
T1	43.0±1.4[a]	143.8±1.4[a]	365.4±2.6[a]	763.6±8.4[a]	1251.9±14[a]	1807.6±26[a]	2344.0±35[a]
T2	44.6±1.6[a]	142.5±1.5[a]	357.0±2.4[b]	739.8±6.9[a]	1225.5±23[a]	1806.0±27[a]	2391.0±31[a]
T3	43.0±1.4[a]	143.6±1.5[a]	357.0±2.9[b]	747.4±12[a]	1232.3±15[a]	1766.3±37[a]	2425.2±36[a]
T4	45.0±1.8[a]	143.0±1.2[a]	366.6±3.1[a]	751.2±6.6[a]	1224.7±17[a]	1759.0±27[a]	2317.4±34[a]

In this and subsequent tables: different letters in the same column means significant differences ($p \leq 0.05$) among treatments; T1, T2, T3 means that birds received magnetic water which being passed by magnetizer device with speeds 5, 10, 15 min respectively to obtain 10 litter magnetic water, whereas treatment T4 received normal tap water (control group)

Table 2: Effect of magnetized water on weekly weight gain (g/bird) (mean±SE) at different ages of Cobb-500 broiler chickens

	Age (week)					
Treatments	1	2	3	4	5	6
T1	101.0±0.3[a]	220.8±1.1[ab]	397.4±4.2[ab]	490.0±6.9[a]	560.8±16[a]	528.3±25[a]
T2	97.5±0.1[b]	215.1±1.5[ab]	382.6±3.9[b]	484.9±30[a]	581.6±28[a]	584.5±20[a]
T3	100.5±0.2[a]	212.8±2.9[b]	401.6±9.5[a]	473.5±7.1[a]	554.9±20[a]	573.2±20[a]
T4	98.1±0.3[b]	222.5±3.6[a]	385.8±2.2[ab]	476.6±7.0[a]	531.7±19[a]	560.0±22[a]

Table 3: Effect of magnetized water on daily feed intake (g) (mean±SE) at different ages of Cobb-500 broiler chickens

	Age (week)					
Treatments	1	2	3	4	5	6
T1	16.9±0.2[ab]	59.3±1.4[a]	105.1±1.0[a]	116.3±1.0[ab]	150.2±1.2[a]	180.0±6.7[a]
T2	17.5±0.2[a]	62.4±.1.1[ab]	103.6±1.0[a]	118.4±1.3[a]	152.8±2.9[a]	178.6±2.9[a]
T3	15.8±0.4[c]	60.9±0.9[a]	105.3±1.9[a]	113.7±1.1[b]	151.0±4.2[a]	177.6±3.4[a]
T4	16.5±0.0[bc]	59.0±0.5[a]	105.2±0.0[a]	114.3±1.0[b]	146.9±2.2[a]	176.3±3.2[a]

Table 4: Effect of magnetized water on feed conversion ratio (g diet/g weight gain) (mean±SE) at different ages of Cobb-500 broiler chickens

	Age (week)					
Treatments	1	2	3	4	5	6
T1	1.27±0.10[a]	1.88±0.04[b]	1.64±0.14[a]	1.63±0.03[a]	1.84±0.05[a]	2.13±0.14[a]
T2	1.17±0.01[a]	2.03±0.03[a]	1.76±0.02[a]	1.70±0.07[a]	1.81±0.08[a]	2.14±0.07[a]
T3	1.10±0.02[a]	1.99±0.05[ab]	1.71±0.02[a]	1.69±0.03[a]	1.90±0.09[a]	2.18±0.10[a]
T4	1.26±0.0[a]	1.87±0.04[b]	1.78±0.01[a]	1.66±0.01[a]	1.94±0.05[a]	2.21±0.07[a]

Table 5: Effect of magnetized water on daily feed intake (g/bird/day), final body weight (g) and weight gain (g), feed conversion ratio (g diet/g weight), mortality (%), viability (%) and production index of Cobb-500 broiler chickens for 42 days old

Treatment	Feed intake (g/bird/day)	Final body weight (g)	Final weight gain (g)	Feed conversion ratio	Total mortality (%)	Total viability (%)	Production index
T1	112.0±2.4[a]	2344.0±16[a]	2298.4±16[a]	1.94±0.01[a]	8.0±3.2[a]	92.0±3.2[a]	264.7±10[a]
T2	109.8±1.2[a]	2391.0±27[a]	2346.4±27[a]	1.90±0.02[a]	5.6±4.1[a]	94.4±4.1[a]	278.8±07[a]
T3	107.2±1.6[a]	2425.2±66[a]	2382.2±66[a]	1.90±0.02[a]	2.7±2.6[a]	97.3±2.6[a]	282.0±10[a]
T4	107.8±1.3[a]	2317.4±10[a]	2272.4±10[a]	2.00±0.01[a]	1.3±1.3[a]	98.7±1.3[a]	278.0±04[a]

production index did not exhibit a significant difference, in spite of the mathematical differences were found in favor of magnetic water treatments (Table 5). Despite, hatching body weight for T4 (control) chicks were higher than magnetic treatments (T1, T2 and T3) in 1 to 2 g (Table 1), however magnetic treatments surpassed T4 at the end of experiment (42 days), since the difference in body weight and weight gain between T3 and T4 were 108 and 110 g respectively (Table 5), which economically is big difference but not statistically significant, that could be a result of disharmonic data of treatment replicates (Gold-Aqua, 2004; Rona, 2004; Mustafa, 2007). T3 expressed its superiority in feed conversion ratio on T4 (control). The difference in this trait reached 0.10 in favor of T3, which is economically important (Table 5). T3 kept on its superiority on T4 in production index, which the difference between them reached 4 points for T3 (Al-Mufaraj *et al*., 2005; Mustafa, 2007). Despite fluctuations in the results, however magnetic water treatments expressed their superiority on non magnetic water (control) treatment, in particular T3. On the basis of our results, we suggest carrying out more traits on various magnetization powers.

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