

EFFECT OF THREE TYPE OF DRINKING WATER ON PERFORMANCE AND SOME OF BLOOD PARAMETER OF BROILER CHICKS

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ABSTRACT

This study was conducted at poultry house in the Veterinary medicine college, University of Basrah, with period 1/11/2017 - 5/12/2017. The present work aimed to evaluate the effect of using three types of drinking water on broiler chicks performance and some blood traits. A total of 90 Ross strain broiler chicks, one day old, used in this study. The chicks were randomly distributed into three groups; 30 chicks for each group with three replicates of each group. The treated groups T1 (chicks drinking Tap water), T2 chicks drinking magnetically treated water by device 1500 Gauss, and T3 chicks drinking RO water. The present study showed significant effect ($p < 0.05$) in live body weight, weight gain, feed conversion ratio and feed intake of treated groups (T2 & T3) compared with T1 (control group). Also, the current study showed significantly rise ($p < 0.05$) on RBC, WBC, HB and PCV ratio in T2 and T3 compared with T1 (tap water).

INTRODUCTION

Water is a major component of plants and animals and, the main medium for biochemical reactions. The magnetic technology has been cited in the literature and investigated since the early of the 19th Century, when Lodestones and naturally occurring magnetic mineral formations were used to reduce the formation of scale in cooking and laundry applications. Today, advances in magnetic and electrostatic scale control technologies have led to their becoming reliable energy savers in certain applications (1). Several articles are available on the

INTRODUCTION

Water is a main component of plants and animals and, the essential medium for biochemical reactions .The magnetic science and technology has been mentioned since the early of the 19th Century, when Lodestones and naturally take place magnetic mineral formations used to reduce the creation of scale in cooking and laundry applications. Today, approaches in magnetic and electrostatic scale control technologies have conducted to their stable energy savers in certain applications (1). Several papers are available on the application of water magnetization (2) counting broiler production (1). Water is normally overlooked as a source of nutrients especially the minerals that may be liquefy in it. Water is the best emulator of elementary substances such as magnesium and calcium which correlate with the hardness of water. Mineral contents vary hugely among water sources. It has been found (3) indicated that drinking water should be pure, tasteless, unscented and colorless. The existence of microorganism is commonly a result of surface contamination by organic substances which led to poor performance, but chlorination or filtration of the water supply can eradicate bacterial contamination (4). (5) showed that young male cattle watered with MW increased their dry feed consumption, while enhance their digestion and nitrogen retention. Piglets watered with MW drank twice as much water, and grew 12.5% larger than the control group).

. Increased in egg production, when the poultry watered with MW, Some researchers explained that magnetized water as compared with the ordinary water resulted in best capacity in agricultural products (6.) Magnetized water is water passed through a magnetic field. It is an inexpensive, environmentally friendly water treatment that has small installation fees and no energy requirements (7) Many claim magnetized water gives increased performance in regards to scale reduction (8), increased crop yields (9).

MATERIAL AND METHODS

This study was conducted from 1/11/2016 to 5/12/2016 in a poultry house in the Veterinary Medicine College. The hall divided into pens provided with a clean and disinfected feeder and drinker, Dry wood shaving used as a deep litter. With 24 hour/day light system. A number of 90 un sexed one day old chicks (Ross) randomly distributed in a three treatment T1 (tap water), T2 (Ro water) and T3 (magnetic water), 30 chick in each treatment with 3 replicate for each treatment each replicate 10 chicks. During the period of experiment used three diets from Barash company ,Starter diet from(1-14)day old percentage of crud protein 23.21% with energy 2925kca/kg ,then grower diets (15-28) day old percentage of crud protein 20.14%, with energy3111kca/kg ,and finisher diet (29-35) day old percentage of crud protein 18.08% with energy 3171kca/kg .The diet was presentation Ad libitum for chicks for a long period of experiment.

STUDING CHARASTRICTIC:

1- Average body weight (gm)

At the age of one day at the beginning of the experiment, the eggs were weighed collectively. The average weight was (45 g) and the weight of the eggs was collected collectively for each one of the repeats per week until the age of 35 day.

1-Live body weight (gm) = the total live weight of the birds at the end of the week (gm) of replicate / number of birds repeated at the end of the week(10).

2-Weekly and cumulative weight gain (gm).

Weekly weight gain (gm) = weight of the body at the beginning of the week - weight of the body at the end of the week. (11).

3- Feed consumption rate (g).

3-

The amount of feed consumed per week was calculated according to the following equation (11).

Feed feed (g) = Amount of presentation food at the beginning of the period (g)

- Amount of food at the end of the period (g).

4-Food conversion efficiency (g feed/ g.weight gain)

The calculation of integrated food conversion (12)

Food conversion efficiency = (average feed intake (g) during a certain period / average weight gain(g) during the same period.

BLOOD SAMPLE

At the end of the experiment blood samples were taken from three birds per random repeater, 3 ml from central medial metatarsal vein, blood placed in EDTA.

Result

Table (1) showed effect of three type of drinking water on weekly live body weight for broiler there was significant effect $p < 0.05$ for T2 and T3 on live body weight on week (2,3,4and 5) compare with T1 (control group).

Table 1: Effect of three type of drinking water on weekly live body weight gm. Mean \pm stander error).

Treatme nt	Weeks				
	1	2	3	4	5
T1	150.33 \pm 12.78 B	356.67 \pm 29.62 B	728.33 \pm 14.81 B	1383.33 \pm 60.09 B	1886.00 \pm 8.27 B
T2	166.00 \pm 3.78	480.00 \pm 15.27 A	833.33 \pm 22.04 A	1550.00 \pm 28.86 A	2220.67 \pm 11.64 A
T3	165.33 \pm 2.90	435.33 \pm 18.26 AB	806.67 \pm 9.28 AB	1498.33 \pm 30.32 AB	2116.00 \pm 6.03 A
LSD	N.S	*	*	*	*

*Values in the same row with different superscripts are significantly different ($p \leq 0.05$)

Table (2) showed effect of three type of drinking water on weekly body weight gain for broiler. There was significant effect $p < 0.05$ in body weight gain for periods (1-2,3-4 and 4-5)weeks in T2 and T3 compare with T1(control group).

Table 2: Effect of three type of drinking water on weekly body weight gain gm. (mean± stander error).

T1	95.33±1 2.78	206.33±4 0.74 B	371.67±4 3.42	655.00±5 5.00 B	486.00± 11.45 B	1841.00± 20.23 B
T2	111.00± 3.78	314.00±1 4.52 A	353.33±2 1.66	716.67±3 0.04 A	566.67± 6.66 A	2175.67± 14.50 A
T3	110.33± 2.90	270.00±2 0.98 AB	371.33±1 9.53	691.67±2 2.04 A	617.67± 4.26 A	2071.00± 12.12 A
LSD	N.S	*	N.S	*	*	*

Values in the same row with different superscripts are significantly different ($p \leq 0.05$) *

Table (3) showed effect of three type of drinking water on weekly feed intake for broiler. There was reduced in feed consumption for T2 and T3 compare with T1 (control group) for periods (3,4 and 5) weeks.

Table (3)Effect of three type of drinking water on weekly feed intake gm/ bird. (mean± stander error).

Treatment	Weeks					
	0-1	1-2	2-3	3-4	4-5	0-5
T1	95.33±1 2.78	206.33±4 0.74 B	371.67±4 3.42	655.00±5 5.00 B	486.00± 11.45 B	1841.00± 20.23 B
T2	111.00± 3.78	314.00±1 4.52 A	353.33±2 1.66	716.67±3 0.04 A	566.67± 6.66 A	2175.67± 14.50 A
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LSD	N.S	*	N.S	*	*	*

Values in the same row with different superscripts are significantly different ($p \leq 0.05$) .

Table (4) showed significant effect $p < 0.05$ in feed conversion ratio for T2 and T3 in (1,2,3,4 and 5) weeks compare with T1 (control group) .

Table 4: Effect of three type of drinking water on weekly and final feed conversion ratio (g. feed /g. weight gain) .(mean \pm stander error)

Treatment	Weeks					
	1	2	3	4	5	1-5
T1	161.00 \pm 3.12	528.50 \pm 24.30	582.67 \pm 8.68 A	1058.33 \pm 54.64 A	1692.33 \pm 96.39 A	4022.83 \pm 80.50 A
T2	150.00 \pm 2.88	535.66 \pm 90.48	543.33 \pm 24.55 A B	898.33 \pm 30.32 B	1250.00 \pm 160.72 B	3377.32 \pm 96.80 AB
T3	150.00 \pm 7.63	442.33 \pm 21.18	503.67 \pm 6.33 B	873.67 \pm 39.49 B	1211.00 \pm 67.48 B	3180.67 \pm 30.55 B
LSD	N.S	N.S	*	*	*	*

*Values in the same row with different superscripts are significantly different ($p \leq 0.05$)

Table (5) showed significant effect $p < 0.05$ in red blood cell count and white blood cell count in T2 (magnetic treated water) compare with T1 (control group) but there is no significant effect in RBC count and WBC count between T2 and T3. There was also significant effect $p < 0.05$ in packed cell volume and hemoglobin percentage for chicks in group (T2 and T3) compare with T1 (control group) .

Table (5)Effect of three type of drinking water on some blood parameters (mean± stander error) .

Treatment	RBC. count Million cell / mm ³ blood	WBC. Count thousand cell / mm ³ blood	PCV%	HB%
T1	2.690±0.283 B	13.883±0.685 B	26.333±0.881 B	7.926±6.679 B
T2	3.803±0.235 A	16.466±0.544 A	38.000±1.520 A	11.500±0.458 A
T3	3.453±0.303 <u>Ab</u>	15.233±0.166 <u>Ab</u>	36.607±1.201 A	11.100±0.360 A
LSD	*	*	*	*

*Values in the same row with different superscripts are significantly different ($p \leq 0.05$) .

DISCUTISSON

The present study showed significant effect ($p < 0.05$) in live body weight, weight gain, feed intake and feed conversion ratio of T2 and T3 groups. Results indicated a significant ($P < 0.05$) improvement in the body weight, weight gain, feed consumption and significant increase ($P \leq 0.05$) in dressing percentage and improved relative weight of the primary carcass cuts. It has been found that using magnetic water with 400, 500, and 600 Gauss improved productive characteristics in broilers chickens (13). The treatment of water magnetically reduces the surface tension of water and increases the surface and permeability of the cells. The increased tensile strength allows the expansion of the gastrointestinal tract and this increases the utilization of the food (14 and 15). Also Showed a significant effect of $p < 0.05$ for the second and third treatments on the weight gain for the weeks (2,4,5), with the highest rates of the second treatment (treated magnetized water) respectively compared to control treatment. This may be due to the superiority that magnetically treated water

has the advantage of increasing the permeability within the cells of the body, which facilitates the absorption of nutrients in addition to the ability of magnetized water to analyze food and improve absorption(16 and 17).

Table 3 showed the effect of three types of drinking water on the average weekly feed consumption of broiler chickens. The results showed that there was no significant effect of drinking water quality on feed consumption rate for broiler chickens for weeks (1 and 2) .The reduced consumption of fodder for broiler chickens with magnetized water and RO water may be due to magnetized water susceptibility to increased nutrient intake through a magnetically treated water can reduce surface tension, and increase surface tension and permeability to cells, allowing gastrointestinal expansion and increased utilization(16and 18) .

This work showed significantly rise ($p<0.05$) on RBC, WBC, HB and PCV ratio in T2 and T2 compared with T1, this finding is in agreement with (19) in which animals received magnetic water showed a significant increases in red blood cells count, This superiority in the number of red blood cells is attributed to the role of magnetically treated water on the speed of influence and spread within the tissue cells, thus increasing the blood circulation and thereby increasing the production of red blood cells on the one hand, and on the other hand the random relationship between the average body weight and number of red blood cells (20) . This superiority in the number of white blood cells is attributed to the role of magnetized water in the stimulation of the lymphatic tissue in the bone marrow responsible for the formation of white blood cells(20). The treatment of hemoglobin and water in the concentration of hemoglobin in the blood is attributed to the rapid relationship between the concentration of hemoglobin and the number of red blood cells (21), as well as the water's ability to provide the iron component in the blood(Mahjob2004). Also improvement in packed cell volume in chicks T2 and T3compared with control group that's improvement due to the relationship between red blood cell count and packed cell volume (20) .

تأثير ثلاثة انواع من مياه الشرب على الاداء الانتاجي وبعض المعايير الدمية لفروج اللحم

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الخلاصة

اجريت الدراسة في قاعة الدواجن التابعة الى كلية الطب البيطري، جامعة البصرة للفترة من ٢٠١٧/١١/١ - ٢٠١٧/١٢/٥. تهدف الدراسة الى تقييم تأثير استخدام ثلاثة انواع من مياه الشرب على الاداء الانتاجي وبعض المعايير الدمية لفروج اللحم. حيث استعمل ٩٠ فرخ من افراخ فروج اللحم سلالة ROSS بعمر يوم واحد وغير مجنسة، وزعت الافراخ عشوائيا الى ثلاثة مجاميع ٣٠ طير لكل مجموعه بواقع ثلاثة مكررات لكل مجموعة، وكانت المعاملات T1 معاملة افراخ التي جهزت بماء اسالة للشرب، T2 معاملة الافراخ التي جهزت بماء شرب ممغنط بجهاز ذو شدة ١٥٠٠ كاوس والمعاملة الثالثة T3 افراخ جهزت بماء RO للشرب. اظهرت نتائج هذه الدراسة وجود تأثير معنوي ($p < 0.05$) في معدل وزن الجسم الحي الاسبوعي، الزيادة الوزنية الاسبوعية، كفاءة التحويل الغذائي ومعدل استهلاك العلف للمعاملتين الثانية والثالثة مقارنة بمعاملة السيطرة (ماء الاسالة). كذلك اظهرت الدراسة ارتفاع معنوي ($p < 0.05$) بمعدل اعداد كريات الدم الحمراء، عدد خلايا الدم البيضاء، نسبة الهيموكلوبين ونسبة خلايا الدم المضغوطة للمعاملتين الثانية والثالثة مقارنة بمجموعة السيطرة (المعاملة الاولى).

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