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EFFECT OF ADDING POTASSIUM IODIDE TO DRINKING WATER AT SUMMER SEASON ON SERUM LIPID PROFILE AND BLOOD CELLULAR TRAITS OF BROILERS CHICKENS

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Abstract

This experiment was conducted in Poultry Farm, Animal Production Department, College of Agricultural Engineering Sciences, University of Baghdad, for the period from 17 / 8 / 2018 up to 28 / 9 / 2018, to investigate the effect of adding Potassium Iodide (KI) In different levels to drinking water of broilers reared in summer season on some blood traits . A total of 240 day old chicks Ross 308 were randomly allocated into four treatments with 3 replicate per each. The average house temperature during the experimental weeks was 32.75ºC. The drinking waters were supplemented with potassium Iodide from the beginning of fourth week until the end of sixth week of age for all treatments except control. The treatments were as follows: T1 = Control treatment without any addition. T2 = Adding 0.25 mg potassium iodide / litter drinking water. T3 = Adding 0.50 mg potassium iodide / litter drinking water. T4 = Adding 1mg potassium iodide / litter drinking water. Results showed that no significant differences were found between treatments in some blood traits as packed cell volume, hemoglobin, cholesterol, Hetrophill, Lymphocyte and their ratio, whereas T4 reduced significantly ($p<0.05$) triglycerides and very low density lipoproteins compared with control. We can concluded from the results of this study that adding 1 mg KI / L litter drinking water have a beneficial effect in reducing some blood lipids of broiler chickens reared under high ambient temperature.

Introduction

Broiler that exposed to stress factors such as that reared in dry hot summer season lead to decreased their growth ratio (Mujahid *et al.,* 2009) that resulted an ambulance in Acid – Base ratio in broilers that suffer from heat stress. There were found some highly heat stress can gave physiological responses if continuous there effects that lead to death and is being heat affect in very degree in state the bird was injured with physiological disturbance whether organic or illness (Babor, 2010). From this, found that added of variety components in diet or drinking water prepare common application for using to decreased the harmful effects for heat stress and raising of physiology performance for broiler (ALqatan, 2006). From this found the using of some additives such as sodium bicarbonate, calcium chloride, ammonium chloride, vitamin C, aspirin as well as potassium iodide that work on arteries protection and considered as enhanced for heart healthy. On the other hand, potassium iodide worked on decreased blood viscosity that resulted from higher in alkaline blood (Madamanchi *et al.,* 2005) and for it protective capacity in cell protection from heat stress that caused higher in body temperature (Wu *et al.,* 2016). Mass *et al.,* 1989 refer to the level of Iodine in Products from Animal origin related with their adding levels to the diets or drinking water for that animals while Shipczynska *et al.,* 2014 founds in their study on laying hens the using of Potassium Iodide increased of Erythrocytes and Hemoglobin concentration significantly ($p<0.05$). Ibrahim *et al.,* 2015 explains that added of 2.4 mg iodine / kg diet improved from blood Parameters and blood traits. The present paper was aim to used potassium iodide with three levels to drinking water for know their effects on physiological performance and some blood traits.

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Materials and Methods

This experiment was conducted in Poultry Farm, Animal Production Department, College of Agricultural Engineering Sciences, University of Baghdad, for the period from 17 / 8 / 2018 up to 28 / 9 / 2018, to investigate the effect of adding Potassium Iodide (KI) In different levels to drinking water of broiler reared in summer

Table 1: Ingredients and calculated analysis of the basal diet.

Finisher(24-42day)%	Growth(12-23day)%	Starter(1-11day)%	Ingredient %
49.7	47.2	45.8	Yellow Corn
11.1	11.3	10	Wheat
27.1	30.6	34.3	Soyben meal
5	5	5	Premix
4.9	3.7	2.6	Vegetable oil
1.1	1.1	1.1	Limeston
0.6	0.6	0.7	Pure Dry Protien
0.3	0.3	0.3	Salt
0.2	0.2	0.2	Mixture of Vitamin and minerals
100	100	100	Total
Chemical Calculated Analysis			
20.00	21.5	23.00	Crude Protien (%)
3200.5	3100.43	3004.25	ME (kcal/kg)
0.47	0.49	0.512	Methionine (%)
1.16	1.25	1.35	Lysine (%)
0.98	0.99	1.02	Calcium (%)
0.47	0.48	0.50	Available phosphate(%)
0.80	0.84	0.885	Methionine +Cysteine(%)

*NRC, 2014.

Table 2: Effect of adding different levels of potassium iodide to drinking water of broiler reared in summer season in PCV % and Hemoglobin (g/100 ml blood) (mean ± standard error).

Age (day)				
42		31		
(g/100 ml blood) Hb	% PCV	(g/ 100 ml blood) Hb	% PCV	treatment
0.34±7.7600	1.04±24.500	0.10±8.1000	0.33±25.33	T1
0.24±7.7500	0.88±24.667	0.26±8.1833	0.57±26.3300	T2
0.24±8.0167	0.88±25.333	0.29±8.2333	0.88±26.6667	T3
0.48±8.4333	1.45±26.667	0.08±7.8000	0.00±25.0000	T4
N.S	N.S	N.S	N.S	ÇáãÚäæíÉ

*Means having different letters in the same Colum are significantly different (p<0.05).

Table 3: Effect of adding different levels from potassium iodide to drinking water of broiler reared in summer season on lymphocyte and heterophill and their ratio (mean ± standard error).

Age (day)						
42			31			
H/L	Lympho	Hetrophill	H/L	Lympho	Hetrophill	
0.01±0.33	8.68±76.67	3.52±25.33	0.04±0.32	9.70±58.67	3.60±18.00	T1
0.04±0.38	9.29±67.00	2.08±24.00	0.04±0.34	3.17±54.67	2.64±20.00	T2
0.01±0.37	8.45±69.67	3.84±22.67	0.05±0.33	2.72±66.33	3.93±21.33	T3
0.01±0.34	7.88±74.67	4.09±25.33	0.03±0.36	5.60±72.33	3.84±26.66	T4
N.S	N.S	N.S	N.S	N.S	N.S	ãÚäæí

*Means having different letters in the same Colum are significantly different (p<0.05).

season on some blood Parameter. A total of 240 day old chicks Ross 308 were randomly allocated into four treatments (60 chicks / treatment) with 3 replicate per each (20 chicks / replicate). The average house temperature during the experimental weeks was 32.75cº. All chicks were fed on standard starter (3004.25 kcal / kg diet ME and 23% crude protein), grower (21.5% crude protein and 3100.43 Kcal / kg ME) and finisher (3200.5 Kcal / kg ME and 20% crude protein) diets (Table 1) and the drink waters for broiler were supplemented with potassium Iodide (KI) from the beginning of fourth week until the end of sixth week for all treatment except control. The four treatment were as follows: T1 = Control treatment without any addition. T2 = Adding 0.25 mg KI / litter drinking water. T3 = Adding 0.50 mg KI / litter drinking water. T4 = Adding 1mg KI / litter drinking water. Blood were obtained from the brachial vein of six birds / treatment at 31 and 42 day of age in order to measure the percentage of packed cell volume (PCV%), lymphocyte (%), hetrophill (%) and their ratio (Campbell, 1995), hemoglobin Hb (g / 100 ml blood) according to Aldarajy *et al.,* 2012, serum lipid profile included: cholesterol (mg / dL) (Bablock, 1988), triglycerides (mg / dL) and high density lipoprotein (HDL) (mg / dL) (Toro and Ackermen, 1975), low density lipoproteins (LDL) (mg / dL) and very low density lipoproteins (VLDL) (mg / dL) (Grandy *et al.,* 2004). Data were analyzed using complete randomize design (CRD) by using ANOVA Table (SAS, 2010), the significant degree were found between average means using L.S.D. analysis by using Duncan Test (Duncan,1955).

Result and Discussion

Blood Cellular traits:

PCV, Hb and H / L ratio:

No significant differences were found between treatments in PCV%, Hb (g/100 ml blood) and (H/L) ratio at 31 and 42 day of age (tables 2 and 3). This result was differ with Ibrahim *et al.,* (2015) who found that adding 1.2 and 2.4 mg potassium iodide to the diet lead to improve blood traits of laying hens. The disagreement of the result of recent study could retain to the differences in reared conditions ambient temperature in this experimental and to the percentage of KI used in addition to the differences between laying

Table 4: Effect of adding different levels from potassium iodide to drinking water of broiler reared in summer season on cholesterol and triglyceride in blood (mean ± standard error).

Age (day)				Treat
42		31		ment
Triglyceride	cholesterol	Triglyceride	cholesterol	
6.64±69.169	3.59±123.67	[a]5.41±75.17	12.56±116.90	T1
2.33±73.167	4.64±148.50	[ab]4.04±69.50	38.51±143.83	T2
6.64±78.667	13.10±152.50	[ab]9.77±65.67	5.37±111.83	T3
3.04±78.500	20.92±149.33	[b]12.30±44.83	14.11±115.83	T4
N.S	N.S	*	N.S	Significant level

*Means having different letters in the same Colum are significantly different ($p<0.05$).

We concluded from the results of this study that adding 1 mg KI / L litter drinking water have a beneficial effect in reducing some blood lipids of broiler chickens reared under high ambient temperature.

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Table 5: Effect of adding different levels from potassium iodide to drinking water of broiler reared in summer season on HDL, LDL and VLDL (mean ± standard error).

Age (day)						Treatment
42			31			
VLDL	LDL	HDL	VLDL	LDL	HDL	
1.32±13.83	[b]1.38±71	1.25±66.50	[a]1.08±15.00	11.90±67.20	2.12±65.67	T1
0.46±14.63	[a]3.12±99.	2.36±63.50	[ab]0.80±13.90	3.99±59.08	0.44±60.83	T2
1.32±15.73	[c]6.61±37.	5.62±68.33	[ab]1.92±12.43	2.98±60.77	0.70±63.50	T3
0.60±15.70	[c]2.77±32.	1.09±62.17	[b]2.46 ± 8.96	16.40±61.30	1.76±63.83	T4
N.S	*	N.S	*	N.S	N.S	Significant level

*Means having different letters in the same Colum are significantly different ($p<0.05$).

Serum Lipid Profile:

Cholesterol and Triglycerides:

From table 4, there was no significant differences between treatments in cholesterol concentrations in blood serum at 31 and 42 day of age. As for triglycerides, their concentrations was significantly ($p<0.05$) reduce in T4 treatment only at 31 day of age (44.83 mg/100 ml blood) compared with control (75.16 mg/100 ml blood). These results were agreed with Ali *et al.,* (2017) who found a significant ($p<0.05$) decrease in triglycerides concentrations in blood serum and in total fat in blood plasma when 2 mg potassium iodide / kg diet.

HDL,LDL,and VLDL:

Results showed that HDL concentrations was not affected due to adding potassium iodide to drinking water of broilers reared in summer season when measured in blood serum at 31 and 42 day of age (Table 5) . Whereas there was significant differences ($p<0.05$) in LDL concentrations between treatments and control at 42 day of age, T4 followed by T3 significantly ($p<0.05$) reduced LDL compared with control. VLDL concentrations were declined significantly ($p<0.05$) at 31 day of age in T4 treatment (8.96 mg / 100 ml blood) compared with control (15.03 mg/ 100 ml blood).

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