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EFFECT OF HEAT EXPOSURE AND GINSENG EXTRACT ON BLOOD CELLS COUNT IN BROILER CHIKS

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ABSTRACT : The current study was conducted on 504(Ros-308) broiler chicks reared in Animal farms belong to College of Agriculture, University of Baghdad during the period 28/9/2017- 9/11/2018 to determine the effect of ginseng additive on the performance of chicks. Results of study showed a significant effect ($p \leq 0.05$) of exposure period an Red blood cells, $3.56 \times 10^6 \text{ ml}^3$ of blood was in bird, which exposure to 2hr at heat shock. In 42 day at age $10^6 \times 38 \text{ ml}^3$ of blood can noticed in the blood at birds, which exposure to 2hr in 21-42 days at 3 days of age. No significant effect at ginseng on blood cells. The results showed a significant effect ($p \leq 0.05$) of interaction on red blood cells at 21 and 42 days of age and the average cells between these ages. Birds were treated with $P_2 G_2$ were the highest 10^6 ml^3 at blood, respectively, the results of RBC namely, 3.66, 3.89 and 3.78.

Key words : Acclimatization, blood cells, broiler.

INTRODUCTION

Poultry are suffer from high temperature during summer, which lead to decrease the production performance (Gharib, 2005). The stress can be defined as a response for external challenge, which make the birds are ready for adaptation with new status. Live organs can continue and make a physiological balance, therefore, any factor which change the maternal stability (Homeostasis) called stressors and we must follow an efficient method to reduce the effect at heat stress in broiler in different ages and the researchers are interest to find active methods to reach for well acclimatization (Yahav and Plavnik, 1999). The acclimatization can be done through exposure to high temperature without any damage for broiler (Bianca, 1959; Khalil, 1993). Ginseng panax is on at plants that use since many centuries for disease treatments and its considered as a grass and medical plant, the plant is still use widely in treatment for many diseases around the world such as China, Japan. In addition, the plant is inter in many drugs compounds .The plant also play crucial rule for decreasing the heat stress effects (Durranim *et al*, 2007) and also in stimulation of heat shock proteins (HSP70) in side cells ,the active substances in this plant can behave as anti oxidant (Liu *et al*, 2002; Wikman, 2009). The major aim of study is to determine the effect of ginseng extract an blood cells (RBC and WBC) and use the information as guidelines for in crease the ability of broiler for heat stress under farming conditions.

MATERIALS AND METHODS

The current study is conducted on 504(Ros-308) broiler chicks during the period 28/9/2018-9/11/2017 to determine the effect of heat shock in early age and additives such as ginseng in three levels. The birds are reader in 36 pins, the water is enriched with sugar, continuous light was used with one hour at dark to a adapt the birds through electric shock. All antibiotics and vaccines were taken (Table 1).

Table 1 :

Age (day)	Species antibiotics and vaccines
1	Newcastle (B1)
2-6	Antibiotics (Iurosul + Newmacin + Minerals and vitamin
10	Newcastle (Lasota)
14	Gombora (Locardmin)
21	Newcastle (Lasota)
31	Newcastle (Lasota)

Cellular traits of blood were measured twice in through the experiment (at 21 and 42 days at age). Plastic dishes were use for feeding (38cm diameter). Ventilation rate was measured by accurate system manufactured in china the data was analyzed statistically by SAS (2012) computer program and the differences among means were tested by Duncan multiple range (Duncan, 1955) according the linear model:

$$Y_{ijk} = \mu + A_i + B_j + AB(ij) + e_{ijk}$$

Where,

μ : overall mean

A_i : effect of heat exposure periods (0, 2, 4 and 6 hr.)

B_j : effect of additives (1, 2 and 3)

$AB(ij)$: effect of interaction

e_{ijk} : is a random error.

RESULTS AND DISCUSSION

Results of study showed a significant effect ($p \leq 0.05$) of exposure period on Red blood cells, $3.56 \times 10^6 \text{ml}^3$ of blood was in bird, which exposure to 2hr

at heat. In 42 day at age (Table 2), $3.10^6 \times 38 \text{ml}^3$ of blood can noticed in the blood at birds which exposure to 2hr in 21-42 days at age. The results are accordance with the results at Ao *et al* (2011) and Yan *et al* (2011).

No significant effect at ginseng on blood cells and this results is not agree with AL-Jubori (2016), who referred that the red ginseng extract cause a significant effect on broiler, according to the interaction, the results showed a significant effect ($p \leq 0.05$) of interaction on red blood cells at 21 and 42 days of age and the average cells between these ages. Birds were treated with P_2G_2 were the highest 10^6ml^3 at blood respectively, the results of RBC namely, 3.66, 3.89 and 3.78 (10^6ml^3 blood).

Table 2 : Effect off heat exposure (38-40C⁰) with ginseng extract on blood cell count.

factors				RBC(10^6ml^3 blood)		
				Age(day)		
Period of exposure(p:hours)	0	Additives	G0	21	42	mean
				3.09±0.17	3.06±0.13	3.07±0.14
				3.20±0.14	3.56±0.13	3.38±0.12
				2.88±0.12	2.98±0.10	2.93±0.11
				3.08±0.12	3.19±0.12	3.14±0.12
Level of significant				NS	NS	NS
Additives	Without adding (G0)			3.01±0.10	3.16±0.11	3.09±0.09
	Adding ginseng extract (G1)			3.27±0.14	3.37±0.14	3.32±0.13
	Adding ginseng extract , vitamin and minerals (G2)			2.91±0.10	3.07±0.10	2.99±0.10
Level of significant				NS	NS	NS
Period of exposure (p:hours)	0	Additives	G0	3.32 ± 0.18 AB	3.24 ± 0.03 AB	3.28 ± 0.10 AB
			G1	3.17 ± 0.32 AB	3.09 ± 0.25 B	3.13 ± 0.28 AB
			G2	2.76 ± 0.33 B	2.85 ± 0.31 B	2.81 ± 0.31 B
	2	Additives	G0	3.03 ± 0.18 AB	3.31 ± 0.20 AB	3.17 ± 0.19 AB
			G1	2.90 ± 0.16B	3.49 ± 0.29 AB	3.19 ± 0.16 AB
			G2	3.66 ± 0.16 A	3.89 ± 0.08 A	3.78 ± 0.09 A
	4	Additives	G0	2.83 ± 0.24 B	2.98 ± 0.23 B	2.90 ± 0.23 B
			G1	2.79 ± 0.22 B	2.95 ± 0.18 B	2.87 ± 0.20 B
			G2	3.02 ± 0.20AB	3.01 ± 0.20 B	3.01 ± 0.19 B
	6	Additives	G0	2.80 ± 0.19B	2.91 ± 0.19 B	2.85 ± 0.19 B
			G1	3.41 ± 0.20 AB	3.52 ± 0.20 AB	3.46 ± 0.20 AB
			G2	3.04 ± 0.10 AB	3.15 ± 0.10 B	3.09 ± 0.10 B
Level of significant				0.05	0.05	0.05

Means with different superscripts within column differ significantly ($P < 0.05$).

Table 3 : Effect off heat exposure (38-40C⁰) with ginseng extract on blood cell count.

factors				WBC(10 ³ ml ³ blood)					
				Age(day)					
Period of exposure(p:hours)	0			21	42	mean			
							19.23 ± 0.48	21.53 ± 0.52	20.38 ± 0.50
							19.00 ± 0.54	20.61 ± 0.42	19.81 ± 0.47
							19.04 ± 0.37	21.06 ± 0.37	20.05 ± 0.37
							19.70 ± 1.01	21.29 ± 0.48	20.50 ± 0.72
Level of significant				NS	NS	NS			
Additives	Without adding (G0)			19.54 ± 0.33	21.62 ± 0.33	20.58 ± 0.33			
	Adding ginseng extract (G1)			18.66 ± 0.43	20.72 ± 0.40	19.69 ± 0.41			
	Adding ginseng extract , vitamin and minerals (G2)			19.54 ± 0.77	21.03 ± 0.41	20.29 ± 0.57			
Level of significant				NS	NS	NS			
Period of exposure (p:hours)	0	Additives	G0	19.85 ± 0.43	22.22 ± 0.42	21.03 ± 0.42			
			G1	18.76 ± 1.01	21.06 ± 1.02	19.91 ± 1.02			
			G2	19.09 ± 1.13	21.31 ± 1.27	20.20 ± 1.20			
	2		G0	19.00 ± 0.81	20.88 ± 0.81	19.94 ± 0.81			
			G1	18.80 ± 1.19	20.55 ± 1.08	19.67 ± 1.14			
			G2	19.22 ± 1.15	20.41 ± 0.48	19.81 ± 0.81			
	4		G0	20.00 ± 0.47	22.02 ± 0.40	21.01 ± 0.43			
			G1	17.89 ± 0.45	19.83 ± 0.47	18.86 ± 0.46			
			G2	19.24 ± 0.22	21.33 ± 0.21	20.28 ± 0.21			
	6		G0	19.30 ± 0.97	21.35 ± 0.93	20.33 ± 0.95			
			G1	19.19 ± 0.95	21.45 ± 0.59	20.32 ± 0.76			
			G2	20.61 ± 3.12	21.08 ± 1.23	20.85 ± 2.17			
Level of significant				NS	NS	NS			

Means with different superscripts within column differ significantly (P<0.05)

Accordance with Simsek *et al* (2007), who reported that the ginseng is play an important rule for stem cells stimulation and lead to increase the RBC production from bone marrow. Results represented in Table 3 showed no significant effect at heat exposure an white blood cells at 21 and 42 days at age and the average between these ages with or without addition at vitamins and mineralsthe results are agree with the results of Sang *et al* (2013) and EL-Badry *et al* (2009). In conclusion, the current study indicated that the ginseng levels lead to enhance the physiological at birds and make an adaptation for heat stress. Therefore, we can recommended for using this plant extract in broiler chick under heat stress and expand for

studies to determine the possible side effects of ginseng and choose the suitable concentration in broiler feeding.

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