STUDY EFFECT OF VITAMIN SUPPLEMENTATION (AD3E) ON PHYSIO-BIOCHEMICAL PARAMETERS IN BROILER CHICKENS IN BASRAH GOVERNORATE

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ABSTRACT

The study was conducted to determine the effect of excessive administration of fat soluble vitamins AD3E in broiler chicks and study their effect on some body organs functions. Forty adult broiler chickens were collected from four different farms of broiler chicken in Basrah city (Ten for each farm), aged 35-45 days. Vitamins AD3E supplemented according to farms regular procedure (15-20 days) of farm cycle. Blood samples were collected from the chickens and divided into two part ; for hematological parameters(WBC,RBC,HB,PCV,PLT) and separated serum for enzymes analysis(ALT,AST,URIC ACID ,Creatinne). The result revealed no significant variation($P<0.05$) among the farms in Hematological parameters (WBC,RBC,HB,PLT,PCV) and in biochemical measurement (ALT ,AST, Uric Acid, Creatinine) although the high dose administration of AD3E vitamins, just in farm 3 that appeared significant increased for above parameter although the period of administration of vitamin soluble in fat represent about 44 -57% from the rearing period.

INTRODUCTION

The poultry industry has experienced a remarkable technical and scientific development in recent years to balance the world's large population growth and increased need to meet requirements by reducing the period of growth and increasing the weight of production [1].These may reduce immune response and decrease disease resistance [2]. In recent years , there was a studies which investigated the importance of vitamins in poultry production[3].Vitamins

contributed to all biological functions of the body that include ;metabolism of carbohydrate ,protein ,fat and energy to reflect growth ,health and feed conversion and reproduction [4]. But according to our observation and follow up in many broiler farms in Iraq , vitamins are used along the period of breeding or at least for about 3 weeks from the total days of breeding (4-5weeks) , especially fat-soluble vitamins that have a toxic level for the birds (hypervitaminosis) ,hypervitaminosis can lead to plucking , poor feather growth or quality , excessive peak or nail growth , hyperactivity , aggression , listlessness and liver or kidney dysfunction and unfortunately death[5].Therefore , the present study is designed to evaluate the fat soluble vitamins level in tissue and evaluate the physiological effect of excessive AD3Evitamins administration in broiler chickens.

MATERIALS AND METHOD

This study was designs to included four poultry farms from different regions of Basrah city / Iraq, which namely: farm 1= Al-Qurna, farm 2= AL-zubair, farm3= Almdayna and farm 4 = Aldeir. Forty adult birds of broiler chickens weighted about (1800- 2200 kg) and aged 45 in farm 1and 4, 35 days in farm 2 and 3. All experimented animal maintained at standard poultry condition and breed procedure and housed at land under controlled temperature and humidity They were given free access to the special dietary formulation pellets that Jordan origin (pellet 1 for first days , medium pellet 2 for middle age and pellet 3 for last week) and water ad labium for the cycle of breed .

Table1: type and amount of AD3E supplemented to chickens in different farms

Days of administration	AD3E	Multivitamins	Farms
20 days	➢ Vit.AD3E oral liquid 1000ml.(0.25-0.5ml / L ➢ Vit.AD3E+C oral liquid (0.5ml/L)	➢ Cholivit-m(100gm/200L water) ➢ Vitron xl multi(1L/200L water	Farm 1
20 days	➢ AD3ECB12(liquid) 2.5ml/100 bird ➢ Vit.AD3E oral liquid (1ml/4L)	➢ Multivitamins(500gm/200L) ➢ Extra Vitasaint (multivitamin)(100gm/200L)	Farm 2
15 days	➢ Sama-vet(AD3E) (1ml/4L) ➢ Zagrosol AD3E liquid (1ml/4L)	➢ Super three puls (multivitamin)(50mg/200L) ➢ Vitamin premix (100gm/400kg) feed. ➢ Aminoaves(multi)3Kg/Ton feed	Farm 3
15 days	➢ Vit.AD3E+C oral liquid (0.5ml/L) ➢ Duphasol AD3E 1ml/4L.	➢ Growvite plus(150gm/100L) ➢ Cholivit-m(100gn/200L) ➢ Chicken Vet.multivitamins-450ml.(10ml/20L)	Farm 4

Blood samples were drained directly by heart puncture by using 5 ml disposable syringe, and then separated into two parts. 3 ml of blood put in sterile labeled tubes (Clot Activator with Gel) and centrifuged (3000 rpm/15 minute) and put in 4C° for serum preparation and biochemical

measurement .The second part of blood was 2 ml put in EDTA Tube for blood hematological parameter.

All blood sample were taken directly to the Al-Hayat private laboratory for hematological parameters analysis (WBC,RBC,HB,PCV,PLT) by using hematology analyzer device (Mindray BC-3000Plus Auto CBC Blood Hematology Analyzer) and biochemical analysis of ALT and AST ,Uric Acid and Creatinine) were done in Al-Hayat private lab. by using chemical analyzer device (Mindray BS 200 Chemical Analyzer) depend on the instruction of Alanine Aminotransferase Kit and Aspartate transaminase Kit Mindray (mindary company) procedure .Also for creatinine and uric acid that used Mindary kit procedure for measurement.

RESULTS AND DISCUSSION

The results showed a significant decrease of WBC, RBC and TTC values in farm 3 compared with other farms of present study. While PCV and Hb revealed non-significant effect on all of studied farms. The hematological parameters values revealed clear differences in their values with normal references values to most of hematological parameters. The results above came in agreed with [6],[7],[8].It has been found that decrease in the number of erythrocytes and other components of blood varied due to the influence of age, environment, exercise, nutritional status and climate, and also attributed the reduction to the different strain of birds, time and duration of experiment and different management systems and also vitamin act as natural antioxidant then lead to reduce in eicosanoids production that led to reduce inflammation [3]. PCV and HB appeared non- significant in all of the `study farms. The present finding is strongly supported by the work of [9] and [10].

Table 2: Hematological parameter values of broiler chicks in Basrah farms supplemented with AD3E vitamin

NO	WBC $X10^{-3}$/ml	RBC× 10^{-6}/ml	PLT $x10^{3}$ u/l	PCV %	HB g/dl
Farm 1	197.31 ± 1.52 a	2.41 ± 0.062 ab	4.66 ± 0.33 a	32.41 ±0.50	10.35 ± 0.117
Farm 2	196.00 ± 1.33 a	2.38 ± 0.042 b	4.50 ± 0.42 a	32.46 ± 0.57	10.50 ± 0.073
Farm 3	184.51 ± 1.33 b	2.48 ± 0.067 ab	2.16 ± 0.30 b	32.79 ± 0.53	10.40 ±0.146
Farm 4	196.05 ± 1.31 a	2.61 ± 0.915 a	4.83 ± 0.30 a	31.97 ± 0.52	10.46 ± 0.111
LSD	11.48	0. 23	2.33	0.37	0.33
Normal value	20 – 30 $\times 10^{-3}$	3 – 4.5 $\times 10^{-6}$	30 -75$x10^{3}$	30 – 50 %	7 – 12 g/dl

* the small letters represent a significant difference at ($p < 0.05$)

*Normal value cited from (DunPow 2005).

Table 3: Liver enzymes activities values in broiler chicks of Basrah farms supplemented with AD3E vitamin.

NO	AST u/l	ALT u/l
Farm 1	507.66 ± 31.54 a	4.83 ± 0.30 a
Farm 2	377.83 ± 13.29 b	4.83 ± 0.30 a
Farm 3	331.50 ± 11.64 b	2.00 ± 0.36 b
Farm 4	331.66 ± 14.70 b	5.33 ± 0.33 a
LSD	129.83	2.83
Normal value	350 U/L	6.36 U/L

* The small letters represent significant different at ($p < 0.05$).
*Normal value cited from (Limdi and Hyde 2003).

The result showed a significant elevation ($p<0.05$) in AST activity in broiler chicks when compared with other studied farms .In contrast ALT enzyme activity revealed a significant decreased in farm 3 values when compared with other studied farms (table 3) . The serum transaminase enzymes values appeared less than the reference values. the results above get agreed with the work of [2],[11],[12],[13]. They detected that AST level elevated significantly with the increase level of vitamin and this might be due to the synergistic action of both of them on the physiological system of the birds, but results was differ to [2] and[14]. The activity of ALT enzyme revealed significant decrease in all studies farm and appeared less than the reference values (table 3). This result get similar to the study of [13], [7] , [15],[16] . It has been found that reduction of serum ALT to the effect of antioxidant function of vitamin E supplementation to the broiler chickens in high dose these lead to reduce the ROS (reactive oxygen species) and scavenger of free radical to prevent the oxidative effect on the liver cell (hepatocyte).

Table 4: Uric Acid and Creatinine values indicator for kidney function of broiler chicks in Basrah farms supplemented with AD3E vitamin.

NO	Uric Acid mg/dl	Creatinine mg/dl
Farm 1	3.23 ± 0.07 b	0.43 ± 0.06 a
Farm 2	2.67 ± 0.15 c	0.50 ± 0.10 a
Farm 3	3.10 ± 0.25 bc	0.26 ± 0.33 b
Farm 4	3.98 ± 0.12 a	0.38 ± 0.03 ab
LSD	0.56	0.23
Normal value	2.0 - 10.0 mg/dl	0.50 mg/dl

* The small letters represent a significant difference at ($p<0.05$).

This result in table (4) above appeared significant differences among all studied farms especially in uric acid values. However, creatinine levels showed significant decreased in farm 3 when compared with other studied farms (table 4). These results was similar to that of [17] and agreement with the experiment of [2] and [10].They attribute causes to the different in nutrition,

proteins and drugs used and also attributed to different climate, age and strain and might be due to the synergistic action of both of them on the physiological system of the birds.

تاثير اعطاء قيتامينات (AD3E) على بعض المعايير الفسلجية والكيمياحيوية في فروج اللحم في محافظة البصرة

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الخلاصة

اجريت الدراسة لتحديد تاثير اعطاء فيتامينات AD3E المفرط في افراخ فروج اللحم على وظائف اعضاء الجسم ، تم جمع اربعون فرخة من دجاج اللحم بعمر ٣٥-٤٥ يوم من اربعة حقول مختلفة من محافظة البصرة (١٠ طيور لكل حقل) تم اعطاء فيتامينات AD3E الى جميع الحقول وفق جدول التربية المعتمد ، ثم جمعت عينات الدم وقسمت الى قسمين ; احدها لقياس صورة الدم (WBC,RBC,Hb,PCV,TTC); والاخرى لفصل مصل الدم لتحليل انزيمات الكبد (ALT and AST) ومؤشرات وظائف الكلى (Uric acid , creatinine) . اظهرت النتائج بعدم وجود فروقات معنوية ($P<0.05$) لمعايير الدم (WBC,RBC,Hb,PCV,TTC) بين حقول تربية فروج اللحم على الرغم من تناولها لكميات كبيرة من فيتامينات AD3E وكذلك لقيم فعالية انزيمات الكبد (ALT and AST) ومؤشرات وظائف الكلى (Uric acid , , creatinine)، بينما اظهرت نتائج الحقل ٣ فروقات معنوية للمعايير اعلاه عند مقارنتها مع حقول تربية الفروج الاخرى التي تناولت الفيتامينات وفق جدول التربية والتي تمثل ٤٤-٥٧ % من دورة التربية.

REFERENCES

1-Sarker EH, Khokon JU, Rahman MA, Mostofa M, Rahman M.(2014) Comparative efficacy of probiotic , neem leaves and vitamin AD 3 E as a growth promoter on broilers.; 1:26–32.

2-Naimi Darush and Reza Vakili, (2014). The study of the effect of different levels of vitamin AD3E on intestinal adhesion, growth performance,feed intake and feed conversion ratio in broiler. Master dissertation. Department of animal

science, College of agriculture, Kashmar branch,Islamic Azad University-Iran.

3-Ramalho HMM, Santos J, Casal S, Alves MR, Oliveira MBPP.(2012). Fat-soluble vitamin (A, D, E, and β-carotene) contents from a Portuguese autochthonous cow breed—Minhota. J Dairy Sci [Internet]. 2012;95(10):5476–84. Available from: http://linkinghub.elsevier.com/retrieve/pii/S0022030212005826

4-Kamalzadeh A.,Ila N., Heydarejad O.,(2009). Effect of Emulsified Vitamins on broiler performance. World J. Zool.2009,4(1):42-46.

5-Johnson EJ, Russell RM.(2010). Beta-Carotene. In: Coates PM, Betz JM, Blackman MR, et al.(*.Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare; 2010:115-20.*

6-Rashmi Rekha Kumari, Pankaj Kumar, TK Mondal(2013). Effect of Vitamin E and Selenium on Hematological Parameters in Sub-acute Toxicity of Hexavalent Chromium in Broiler Chick national journal of physiology, pharmacy & pharmacology , vol 3 , issue 2:| 158 – 161.

7-Paul RC, Ahmad N, Moinuddin MA, Hasan N. (2010). Effects of administration of multivitamins and enzymes for broilers either singly or in combination on body weight and haemato- biochemical parameters.;8(1):39–44.

8-Mohammad Harun-Ar-Rashid, Nazim Ahmad, Mohammad Rohul Amin and Mohammad Lalmoddin Mollah (2015). Effects of selected vitamins and minerals on growth rate and hematological parameters in broilers, Asian J. Med. Biol. Res. , 1(3), 487-494;

9- Javed MT, Ahmad F, Rafique NZ and Bashir M (2003). Effects of higher levels of chromium and copper onsome hematological parameters and serum proteins in broilers. Pakistan Veterinary Journal, 23: 31-35

10-Trans B, Inal F, Bas AL, Altunok V, Elmas M and Yazar E, (2000). Effect of continuous supplementation of ascorbic acid, aspirin, vitamin E and selenium on

performance immune response and some biochemical parameters under normal environmental and management conditions in broilers Archiv-fur-Gerflugelkunde,65: 187-192.

11-Ahmed, M. B. Rashid, N. S. Lucky1, N. Ahmad and M. Myenuddin (2007). Effect of enzyme and vitamin supplementation on physio-biochemical parameters in broiler chickens, *Bangl. J. Vet. Med*. 5 (1 & 2): 55–58 .

12-Bayram I, Midilli M, Tuncer Sd and Kilinc C (2004). the effects of supplementation of protein and mineral to the rations on some blood parameters of broilers. *indian veterinary journal* 81(11):1213-1216.

13-Swain BK and Johri TS (2000). effects of supplementation of combinations of different levels of selenium and vitamin e on relative weight of some organs and serum enzymes level in broilers. *indian journal of poultry science* 35 (1): 66-69.

14-Nkosi CZ, Opoku AR and Terblanche SE (2005). effect of pumpkin seed protein isolate on the activity levels of certain plasma enzymes in ccl4-induced liver injury in low-protein fed rats. *phytotherapy research* 19(4): 341–345.

15-Frances Sienkiewicz; Ellie Whitney (2008). *Nutrition: Concepts and Controversies* (11 ed.). United States of America: Thomson Wadsworth. pp. 221, 235. ISBN 0-495-39065-8.

16-Hamad Em, Taha Sh, Dawood A, Sitohy Mz and Abdel-Hamid M (2011). protective effect of whey proteins against nonalcoholic fatty liver in rats. *lipids health disease* 10:57.

17-Chandra M, Singh B, Singh N and Ahuja SP (1984). hematological changes in nephritis in poultry induced by diets high in protein, high in calcium, containing urea, or deficient in vitamin a. *poultry science.*