



**EFFECT OF DIETARY SUPPLEMENTATION OF GRAPE SEED EXTRACT OR VITAMIN E AS ANTIOXIDANT ON REPRODUCTIVE AND PHYSIOLOGICAL PERFORMANCE DURING SUMMER SEASON**

**2- AGED MALES DEVELOPED CHICKENS**

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**ABSTRACT:**The objective of this study was evaluate the effect of dietary grape seed extract (GSE) or vitamin E (VE) supplementation on some reproductive and physiological performance traits of aged males of Dandrawy strain during summer months. A total number of 150 laying hen plus 30 cocks of Dandrawy (DN) strain at 60 weeks of age were used in this experiment up to 72 weeks of age. All birds were randomly divided into five equal groups each of 30 females and 6 males, with six equal replicates, wing banded and individually weighed, with nearly similar average initial live body weight of all groups. The 1st group (T1) was fed the basal diet contained 10 mg V E/kg diet according to NRC, (1994), and served as control, while 2nd, 3rd, 4th and 5th groups (T2,T3,T4 and T5 respectively) were fed the basal diet supplemented with 100,200mg GSE 150 and 200 mg V.E/kg diet, respectively. The obtained results indicated that increasing supplemental (GSE) or (V.E) resulted in an increase insignificantly in final body weight and body weight gain, however they did not affect feed consumption of cocks. All concentrations of dietary (GSE) or (V.E) had significant ( $p \leq 0.05$ ) improvements in semen quality. Also, there was significant ( $p \leq 0.05$ ) increase of the fertility and hatchability percentages from total eggs and hatchability from fertile eggs. Plasma of Tri Glycerides, Cholesterol, LDL, Glucose, and MDA were decreased ( $p < 0.05$ ) for cocks either supplemented with GSE or Vit. E, while HDL, Total Protein, Albumin, GSHPx and SOD, were increased ( $p < 0.05$ ). There were Significant ( $p < 0.05$ ) differences between treatments for IgG and IgM and the best value was recorded in the group received 200 mg (GSE)/kg diet followed by the group received 200mg (Vit.E). The (GSE) or (Vit.E) supplementation at 200 mg/kg diet had significantly greater testosterone, T3 and T4 concentrations ( $p < 0.05$ ) in blood serum than the other groups. It could be recommended that supplementing the Dandrawy cocks diet with 200, mg/kg diet (GSE) or (Vit.E) may alleviate the negative effect of hot temperature during summer season and may improve most of the previous mentioned reproductive traits, semen quality, fertility and hatchability and blood parameters.

**Key Words:** Grape seed-Vitamin E-Summer season-Aged cocks.

## INTRODUCTION

High ambient temperature is one of the environmental factors influencing physiological traits and production of poultry (Azad et al., 2010). Ambient temperature over 32°C causes heat stress in broilers (Cooper and Washburn, 1998), which induces behavioral and physiological responses reflected by immune suppression, high mortality rate and slight growth (Mujahid et al., 2005). Heat stress induces oxidative stress that result in increased reactive oxygen species production (Halliwell and Gutteridge, 1989). Antioxidants play an important role in protecting cells from reactive oxygen species by reducing free radicals and preventing the peroxidation of lipids (Grashorn, 2007; and Nanari et al., 2004). The antioxidants system of birds includes both enzymatic and non enzymatic defenses (Surai, 2000). The principal enzymatic systems like superoxide dismutase, glutathione peroxidase (Fang et al., 2002). The tissue status of endogenous antioxidant enzymes are considered as markers for evaluating oxidative stress (Panda et al., 2008). Nonenzymatic antioxidants include molecules like Vit.E and flavonoids. Modern poultry production greatly depends on understanding of the relationship between diet, bird health and product quality. Therefore optimizing the dietary intake of antioxidant nutrients is an important step in balancing oxidative damage (Choi, 2008). Grape skins and seeds are rich sources of flavonoids including monomeric phenolic compounds. Studies have shown that flavonoids have the capacity to act as powerful antioxidants by scavenging free radicals and terminating oxidative reactions (Gonzalez-Paramas et al., 2004; Yilmaz and Toledo, 2004; and Ruberto et al., 2007). Vitamin E, a fat soluble vitamin is a biological chain-breaking antioxidant that protects cells and tissues from

lipoperoxidative damage induced by free radicals.

(Goni et al., 2007) showed that an increase in the antioxidative activity of male broiler chicks diet, excreta, and meat as a result of the dietary administration of 200 mg/kg grape pomace concentrate and 150 IU/kg vitamin E in male broiler chicks at 3 wk of age. Cao et al. (2004) reported that Synergistic antioxidant activities of Vitamin E and grape seed may also be responsible for the significant increase in the testosterone concentrations in the bird supplemented with vitamin E and grape seed each at 0.5% level in poultry diets.

Fed adult male White Leghorn chickens with diets containing of vitamin E (166.3 mg/kg feed) for 45 weeks the males fed with diets containing vitamin E showed impaired fertilizing capacity and sperm concentration in the semen (Arscott et al., 2001). Therefore, the main goal of this study was to investigate the effect of grape seed extract or vitamin E on productive and physiological performance under environmental summer conditions of aged males developed chickens.

## MATERIALS AND METHODS

This experiment was conducted at Seds Poultry Research Station, Animal production Research Institute, Agricultural Research Centre, Ministry of Agriculture during summer season between June and August 2016.

### Experimental design:

A total number of 180 Dandrawy (Dn) strain birds (150 hens and 30 cocks) 60-wks-old were used in this experiment up to 72 wks of age. All birds were individually weighed and randomly divided into 5 equal experimental groups (30 hens and 6 cocks of each) with six replicates (5 hens and 1 cock each) with almost similar initial average body weight. Replicates were randomly housed individually in single cages in an open system floor pens (280 cm

long x 220 cm wide). The ambient temperature and relative humidity were monitored daily (37 °C and 65% RH).

The first group was fed the basal diet contained 10 mg VE/kg diet according to NRC (1994), and served as control. The second, third, fourth and fifth groups were fed the basal diet supplemented with 100, 200mg GSE, 150 and 200 mgVE /kg diet, respectively.

**Management and feeding:**

All birds were kept under the same managerial hygienic and environmental conditions. Birds were kept in a windowed house with light cycle regimen of 16 h light: 8 h darkness, throughout the experimental period (60-72 wks of age). Feed and water were provided for ad libitum consumption. Birds were fed layer diets according to NRC (1994). The composition and calculated analysis of the basal diet (Table 1) showed the adequacy of all nutrients needed for layers.

**Preparation of grape seed extract:**

Grape seeds powder was purchased from local market. The seeds powder was melted in 75% ethanol for 72 hr at room temperature. The ethanolic extract was evaporated (Rotary Evaporator) to eliminate ethanol and obtain GSE as a lyophilized powder (yield 25-30%) according to Sarkaki et al. (2013).

**Measurements:**

**Performance traits:**

Body weights were recorded at the beginning (60 weeks of age) and the end of the experiment (72weeks of age), while, feed consumption was weekly measured.

**Semen quality:**

Semen samples were collected randomly from 15 cocks (3 cocks of each treatment) at 72 weeks of age using the abdominal massage method. Semen samples were examined according to Kalamah et al. (2000), to determine ejaculate volume (ml), advanced motility score, alive sperm (%), died sperm %, sperm concentration ( $10^9$ / ml) and sperm abnormality %. The ejaculate volume was determined to the

nearest 0.01 ml. using 1.00 ml. tuberculin syringe. Sperm concentration was determined by using Thomes–Zeishaemocytometer. Mass motility score (from 1 to 5 grades). Total live sperm/ejaculate  $\times 10^9 = (\text{sperm concentration} \times \text{live sperm\%} / 10)$ . Total abnormal sperm/ejaculate  $\times 10^9 = (\text{sperm concentration} \times \text{abnormal sperm\%} / 10)$ . Total live sperm/ejaculate  $\times 10^9 = (\text{sperm concentration} \times \text{live sperm\%} / 10)$ .

**Fertility and hatchability:**

The hens were inseminated using 0.05 ml of semen twice a week with diluted 1:1. A total of 600 eggs were collected and incubated to calculate fertility at 72 weeks of age. Hatchability was calculated as a percentage of fertile eggs or of total egg set.

**Blood analyses:**

At the end of the trial, 3 cocks were slaughtered and blood samples were collected in tubes contained EDTA during bleeding. The blood samples were centrifuged at 3000 RBM for 20 minutes to separate plasma. Plasma samples were stored frozen at -20 c until assayed for blood analysis. Total protein, albumin and glucose levels were estimated according to (Domas et al., 1981). Also plasma triglycerides, high-density lipoprotein (HDL), low-density lipoprotein (LDL), glucose, cholesterol, superoxide dismutase (SOD), glutathione peroxidase (GSHPx), and malondialdehyde (MDA) were measured by spectrophotometer using available commercial Kits produced by Bio-diagnostic, Egypt. Also blood plasma were taken to measure immunoglobulin (Ig) fractions according to Saif and Dohms (1976). Plasma triiodothyronine (T3) and thyroxine (T4), (Beckman Coulter Company) and testosterone hormone, (Sigma company) were determined

**Statistical analysis:**

The data were classified and tabulated on Microsoft Excel 6 in Windows 98 then were analyzed by statistical program on (SPSS, 2001) Windows. Mean and standard

errors were independently calculated and the analysis of variance was applied. Significant differences between each two means were evaluated utilizing Duncan's multiple F test (Duncan, 1955).

## RESULTS AND DISCUSSION

### Productive performance:

The effects of supplemental dietary Grape seed (GSE) or vitamin E (VitE) on performance of (DN) cocks are shown in (Table 2). Increasing supplemental Grape seed or vitamin E resulted in an insignificant increase in both final body weight and body weight gain. Also, they did not affect feed consumption of (DN) cocks. These findings are in agreement with results obtained by many authors who revealed that feeding diet containing grape seed oil did not have any significant contribution to body weight gain (Goni et al., 2007; Ozgan et al., 2009; and Dorriet al., 2012). On the other hand, Hosna et al. (2015) observed that Grape seed supplementation at the levels of 150 or 300 mg/kg diet increased body weight of broiler chickens compared with control group pre-heat stress condition. Also the present results disagree with Goni et al. (2005) who reported that dietary (Vit.E) treatment had significant ( $p < 0.05$ ) effect on body weight of broiler chickens at 35 and 38 day of age. However Panda et al. (2009) mentioned that results of vit.E on performance of broilers, layers and turkey varied depending up on level of vit.E as well as genetic stocks and age. On the other hand, many publications indicated that, supplemental dietary Grape seed (GSE) or vitamin E (Vit.E) alleviated the negative effect of high temperature during the summer season on feed consumption, body weight and body weight gain of broiler chickens (Hughes et al., 2005; and Hai et al., 2000) and laying hens (Blakeslee and Wilson, 1979; and Ciftci et al., 2005).

### Semen Physical Properties:

Data in Table (3) showed the effects of supplemental dietary (GSE) or (VE) on physical semen quality of (DN) cocks at 72

weeks of age. Significant ( $p \leq 0.05$ ) improvements in semen physical properties were observed as affected by supplementing (GSE) or (VE) compared with the control group, (GSE) or (VE) supplementation significantly ( $p \leq 0.05$ ) increased Ejaculate volume (ml), advanced motility score, sperm concentrations ( $10^9/\text{ml}$ ) and live sperm (%) compared with the control group. Supplementing diet with (GSE) or (VE) concentrations significantly ( $p \leq 0.05$ ) decreased died sperm % and sperm abnormality % compared with the control.

Similarly, Arscott et al. (2001) reported that adult male White Leghorn chickens fed with diets containing of vitamin E (160 mg/kg feed) for 45 weeks showed improved fertilizing capacity and sperm concentration in the semen. Moreover Cerolini et al. (2005) reported that dietary supplementation of vitamin E was associated with increased fertilizing ability and semen quality of cockerels. The reduced sperm abnormality might also be due to the ability of antioxidant (vit.E) to resist the oxidative DNA damage and genetic alterations in the spermatozoa (Bagachi et al., 1997).

Priyal et al. (2012) reported that supplementation with one percent grape seed powder had significantly higher testosterone concentration as well as significantly improved in semen characteristics in the broiler breeder cocks. Significant improvement in the sperm viability and decrease in sperm abnormality might be due to the synergistic actions of the antioxidants of grape seed which reduced the oxidative damage and maintained the membrane integrity of cell membrane (Ajit Vaze, 2007).

### Fertility and Hatchability Percentages:

Results in Table (4) summarizes the effects of supplemental dietary (GSE) or (VE) on fertility and hatchability percentages. All concentrations of dietary (GSE) or (VE) significantly ( $p \leq 0.05$ ) increased the fertility and hatchability percentages from total

eggs and / or hatchability from fertile eggs compared with those of the control. Moreover, the best significant results of fertility% (91.88% and 90.91%) were recorded for eggs produced from birds fed diet supplemented with (200 mg/kg) GSE, or (VE), respectively compared with those of the other egg groups. The concentration of GSE or VE (200 mg/kg for both) realized the best significant result of hatchability from total eggs (84.81 and 83.89%) and/or hatchability from fertile eggs (94.12% and 91.64%), respectively compared with other groups.

This result agrees with those reported by Cerolini et al.(2005) who reported that dietary supplementation of vitamin E was associated with increased fertilizing ability of cockerels. Also, Turgay et al. (2008) reported that basal diet was supplemented with vitamin E 30, 45, 60 and 75 mg/kg improved fertility rate and hatching rate. The improved results of fertility and hatchability in this study might be due to elevated level of testosterone hormone as well as improved quality of semen with in groups fed on both vit.E and GSE.

**Blood parameters:**

Table (5) summaries the effects of (GSE) or (VE) dietary supplementation on some blood parameters values of D.N cocks. It is clear that the Tri Glycerides mg/dl, Cholesterol mg/dl, LDL mg/dl, Glucose mg/dl, and MDA U/L were significantly decreased ( $p<0.05$ ) by GSE or VE supplementation to the basal diet. In the study done by Virden and Kidd (2009), 100 and 150 mg/kg grape seed extract supplementation in broiler chickens diet induced a significant drop in blood glucose concentration. However, Ozgan et al. (2009) suggested that dietary inclusion of 2% grape seed oil significantly increased plasma glucose concentration while decreasing plasma cholesterol level and egg yolk cholesterol level. On the other hand HDL mg/dl, Total Protein mg/dl, Albumin mg/dl, Glutathione peroxides U/L and SOD mol/L were significantly increased

( $p<0.05$ ).This is in agreement with the findings of previous studies done by Benzie (2003) and Ngamukote et al. (2011) who reported that Grape seed extract has plenty of antioxidant substances that have decreasing effect on bad cholesterol (LDL) and increasing effect on good cholesterol (HDL) and significant improvement in glutathione peroxides(GSH-Px), superoxide dismutase (SOD), and total protein (TP). Lipid peroxidation and antioxidant indicators activities of birds as fed on grape seed extract or (VE) supplementation are illustrated also in Table (5). The supplementation level of 200 GSE or VE had a significant decrease of MDA, while increased SOD and GSH-Px, as compared with other group.

In this regard, Mujahid et al. (2007) and Tan et al. (2010) indicated that high ambient temperature causes oxidative stress and tissue damage via lipid peroxidation. Furthermore, Sahin et al. (2010) observed that exposure to heat stress increased hepatic MDA level and decreased hepatic SOD and GSH-Px activities. The data in Table (5) showed that control treatment without any supplementation with exposure to high ambient temperature significantly increased glucose, cholesterol, TG, LDL,MDA while decreased SOD and GSH-Px activities. These results are in agreement with Attia et al. (2010) who noted that chronic heat stress significantly increased plasma triglycerides. Similar results were obtained by Sahin et al. (2010) who found that, in response to increasing supplemental green tea polyphenol level, there were linear decreases in hepatic MDA level and linear increases in hepatic SOD and GSHPx activities.

Results in Table (6) shows that there were significant ( $p<0.05$ ) differences between treatments for IgG and IgM and the highest value was recorded in the group given 200 mg grape seed extract/ kg diet followed by the group received 200 mg VitE/ kg diet and then the group received grape seed or vit.E at levels 100 and 150 mg/kg. These results are in agreement with Niu et al.

(2009) who found that broilers receiving 200 mg/kg of vitamin E had significantly higher macrophage activities and more IgM and IgG antibodies under heat stress (38°C) than those not supplemented. Mashaly et al. (2004) reported that humoral immunity of birds from heat stress is depressed. Zulkifli et al. (2000) showed that heat stress caused a reduction in antibody synthesis. This reduction has been due to an increase in inflammatory cytokines under stress, which stimulates the hypothalamic production of corticotrophin releasing factor (Sapolsky et al., 1987; and Mashaly et al., 2004). Vitamin E has been reported to protect cells involved in immune responses such as lymphocytes, macrophages and plasma cells against oxidative damage and to enhance the function and proliferation of these cells (Puthongsiriporn et al., 2001). Hence Grape seed extract has been shown to have anticancer effect as well as antibacterial, antiviral and antifungal activities (Cos et al., 2003) so it enhances immune responses. This is also mentioned by Ozgan et al. (2009) who suggested that dietary inclusion of 200 mg/kg diet grape seed extract improved immunoglobulin G (IgG), IL-6 and lymphocytes (T-helper and T-cytotoxic). Also Farahat et al. (2016) reported that the antibody titer against New castle disease virus vaccines was significantly elevated in 28 and 35 day old broiler chickens fed with a diet supplemented with GSE that could increase the integrity and proliferation of B-Lymphocytes and its differentiation into

antibody producing plasma cells. Moreover, the data in Table (6) indicated that GSE or VE supplementation at 200 mg/kg diet had significantly ( $p < 0.05$ ) greater testosterone, T3 and T4 concentrations in blood plasma than the other groups. While the results of control group revealed that heat stress causes significant decrease of testosterone level that may be a result of direct damage of dicofol on leydig cells, which are the main site of testicular androgen biosynthesis. Results of the present work agreed with those found by Anjum et al. (2016) indicated that under heat stress, the amounts of testosterone, T3 and T4 hormone level significantly reduced, while there were significantly improved due to supplementation chicken diets with different antioxidant.

#### **CONCLUSION,**

supplementing the Dandrawy cocks diet with 100, 200 mg/kg diet GSE or 150, 200 mg/kg diet of vitamin E, respectively alleviated the negative effect of summer condition and improved most of the previous mentioned reproductive traits, semen quality, fertility and hatchability percentages and blood parameters. However, 200 mg/kg supplementation for either Grape seed or vit.E was more effective than 100 mg Grape seed and 150 mg vit.E /kg diet.

## Grape seed- Vitamin E- Summer season- Aged cocks.

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**Table (1):** Composition and calculated analysis of the basal diet

Yellow corn	66.00
Soybean meal 44%	23.00
Wheat bran	2.50
Di-calcium phosphate	1.50
Limestone	6.20
Salt (NaCl)	0.40
DL-Methionine	0.10
Vit.& Min. Mixture*	0.30
<b>Total</b>	<b>100.00</b>
Calculated analysis:	
Metabolizable energy (Kcal / Kg)	2747
Crude protein%	15.67
Crude fiber %	3.46
Crude fat %	2.96
Calcium %	3.34
Available phosphorous %	0.42
Lysine %	0.89
Methionine %	0.39
Met+cystine %	0.66

\*Supplied per kg of diet: Vit.A, 10 000 IU; Vit. D3, 2000IU; Vit. E, 10 mg; Vit. K3, 1mg; Vit B1, 1mg; Vit. B2, 5mg ; Vit.B6, 1.5 mg; Vit.B12, 10 mg; Niacin, 30mg; Pantothenicacid, 10 mg; Folicacid, 1 mg ; Bioin, 50 mg ; Choline chloride, 520 mg; Copper, 4 mg; Iron, 30 mg; Manganese, 60 mg; Zinc, 50 mg; Iodine, 1.3 mg; Selenium, 0.1 mg;and Cobalt, 0.1mg.

**Table (2):**Effect of dietary Grape seed or vitamin E supplementation on productive performance parameters of (D.N) cocks during experimental period (M  $\pm$  S.E)

<b>Treatments</b> <b>Items</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>	<b>T5</b>
<b>Initial body weight(g)</b>	1186.50 $\pm$ 0.89	1193.00 $\pm$ 3.27	1198.33 $\pm$ 1.61	1194.67 $\pm$ 1.10	1197.42 $\pm$ 3.83
<b>Final body weight(g)</b>	1347.33 $\pm$ 35.3 9	1354.92 $\pm$ 32.3 5	1363.41 $\pm$ 41.26	1356.79 $\pm$ 44.61	1362.25 $\pm$ 46.58
<b>Weight gain(g)</b>	160.83 $\pm$ 12.83	161.92 $\pm$ 22.09	165.08 $\pm$ 19.9 4	162.12 $\pm$ 33.70	164.83 $\pm$ 10.04
<b>Feed consumption g/bird/day</b>	102.07 $\pm$ 1.72	105.41 $\pm$ 1.77	107.73 $\pm$ 2..04	104.64 $\pm$ 2..2 1	107.77 $\pm$ 2.1 2

\*No significant differences were observed among treatments in all parameters studied.

T1: Control

T2: Grape seed(100 mg/kg)

T3: Grape seed(200 mg/kg)

T4: Vit.E (150 mg/kg)

T5: Vit.E (200 mg/kg)

**Grape seed- Vitamin E- Summer season- Aged cocks.**

**Table (3):**Effect of dietary Grape seed or vitamin E supplementation on semen quality traits of (D.N) cocks at 72 weeks of age (M ± SE)

<b>Treatments</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>	<b>T5</b>
<b>Items</b>					
<b>Ejaculate volume (ml)</b>	0.33 <sup>c</sup> ± 0.33	0.39 <sup>b</sup> ± 0.33	0.43 <sup>a</sup> ± 0.33	0.38 <sup>a</sup> ± 0.33	0.41 <sup>a</sup> ± 0.67
<b>Sperm motility(1-5)</b>	2.87 <sup>c</sup> ± 0.33	3.64 <sup>b</sup> ± 0.33	4.00 <sup>a</sup> ± 0.58	3.33 <sup>b</sup> ± 0.33	3.98 <sup>a</sup> ± 0.33
<b>Sperm concentration (10<sup>9</sup>/ml)</b>	1.97 <sup>c</sup> ± 1.67	2.33 <sup>b</sup> ± 1.67	2.97 <sup>a</sup> ± 4.63	2.28 <sup>b</sup> ± 4.93	2.90 <sup>a</sup> ± 0.67
<b>Alive sperm %</b>	77.67 <sup>c</sup> ± 1.76	87.00 <sup>b</sup> ± 4.36	90.87 <sup>a</sup> ± 5.29	86.33 <sup>b</sup> ± 5.78	90.06 <sup>a</sup> ± 1.45
<b>Died sperm %</b>	9.33 <sup>a</sup> ± 0.33	6.00 <sup>b</sup> ± 0.58	4.03 <sup>c</sup> ± 0.33	6.50 <sup>b</sup> ± 0.33	4.44 <sup>c</sup> ± 0.33
<b>Sperm abnormality %</b>	13.00 <sup>a</sup> ± 0.58	7.00 <sup>b</sup> ± 0.58	5.10 <sup>c</sup> ± 0.58	7.17 <sup>b</sup> ± 0.03	5.50 <sup>c</sup> ± 0.58

<sup>a, b, c</sup> = Means in the same row within each parameter differently superscripted are significantly different (p≤0.05)

T1: Control

T2: Grape seed(100 mg/kg)

T3: Grape seed(200 mg/kg)

T4: Vit.E (150 mg/kg)

T5: Vit.E (200 mg/kg)

**Table (4):**Effect of dietary Grape seed or vitamin E supplementation on fertility and hatchability percentages of (D.N) cocks at 72 weeks of age (M ± SE)

Treatments	T1	T2	T3	T4	T5
<b>Fertility%</b>	80.01 <sup>c</sup> ± 0.81	86.22 <sup>b</sup> ± 1.67	91.88 <sup>a</sup> ± 1.14	85.40 <sup>b</sup> ± 1.34	90.91 <sup>a</sup> ± 2.84
<b>Hatchability % from total eggs</b>	73.02 ± 3.64	80.16 <sup>b</sup> ± 1.19	84.81 <sup>a</sup> ± 3.00	79.19 <sup>b</sup> ± 1.74	83.89 <sup>a</sup> ± 3.54
<b>Hatchability % from fertile eggs</b>	78.13 <sup>c</sup> ± 1.44	84.16 <sup>b</sup> ± 0.66	94.12 <sup>a</sup> ± 3.18	83.15 <sup>b</sup> ± 2.03	91.64 <sup>a</sup> ± 1.12

a, b, c. = Means in the same row within each parameter differently superscripted are significantly different (p≤0.05)

T1: Control

T2: Grape seed(100 mg/kg)

T3: Grape seed(200 mg/kg)

T4: Vit.E (150 mg/kg)

T5: Vit.E (200 mg/kg)

**Table (5):** Average values ( $M \pm SE$ ) of some blood parameters of (D.N) cocks as affected by dietary Grape seed or vitamin E supplementation

Treatments	T1	T2	T3	T4	T5
<b>Items</b>					
<b>Tri Glycerides mg/dl</b>	138.23 <sup>a</sup> ±1.63	127.93 <sup>b</sup> ±1.61	112.57 <sup>d</sup> ±3.07	122.19 <sup>c</sup> ±0.73	119.49 <sup>c</sup> ±0.59
<b>Cholesterol mg/dl</b>	203.33 <sup>a</sup> ±2.35	186.91 <sup>b</sup> ±4.15	158.57 <sup>c</sup> ±1.89	179.76 <sup>b</sup> ±1.67	162.38 <sup>c</sup> ±2.08
<b>LDL mg/dl</b>	106.13 <sup>a</sup> ±0.31	80.13 <sup>b</sup> ±1.00	60.91 <sup>c</sup> ±2.45	81.42 <sup>b</sup> ±1.31	69.66 <sup>c</sup> ±2.29
<b>HDL mg/dl</b>	50.28 <sup>d</sup> ±1.69	59.03 <sup>c</sup> ±0.74	80.14 <sup>a</sup> ±1.14	58.98 <sup>c</sup> ±1.57	75.00 <sup>b</sup> ±0.72
<b>Glucose mg/dl</b>	173.49 <sup>a</sup> ±1.97	166.19 <sup>b</sup> ±1.00	148.14 <sup>d</sup> ±1.37	161.23 <sup>c</sup> ±1.21	149.19 <sup>d</sup> ±0.78
<b>Total. Protein mg/dl</b>	5.71 <sup>d</sup> ±0.04	6.67 <sup>c</sup> ±0.09	7.31 <sup>b</sup> ±0.03	7.16 <sup>ab</sup> ±0.04	7.10 <sup>a</sup> ±0.03
<b>Albumin mg/dl</b>	3.60 <sup>c</sup> ±0.05	4.12 <sup>b</sup> ±0.03	4.40 <sup>a</sup> ±0.02	4.09 <sup>b</sup> ±0.02	4.35 <sup>a</sup> ±0.03
<b>Malondialdehyde (MDA) U/L</b>	13.94 <sup>a</sup> ±0.98	10.71 <sup>bc</sup> ±0.19	8.69 <sup>d</sup> ±0.17	11.05 <sup>b</sup> ±0.26	9.31 <sup>cd</sup> ±0.21
<b>Glutathionperoxidase(GSH-Px)U/L</b>	2.06 <sup>d</sup> ±0.03	2.35 <sup>c</sup> ±0.03	3.08 <sup>a</sup> ±0.11	2.26 <sup>c</sup> ±0.03	2.82 <sup>b</sup> ±0.03
<b>Superoxidedismutase(SOD)mol/L</b>	138.50 <sup>c</sup> ±1.38	203.23 <sup>b</sup> ±6.77	245.67 <sup>a</sup> ±7.15	202.00 <sup>b</sup> ±1.80	236.83 <sup>a</sup> ±7.67

<sup>a, b, c</sup> = Means in the same row within each parameter differently superscripted are significantly different ( $p \leq 0.05$ )

T1: Control                      T2: Grape seed(100 mg/kg)                      T3: Grape seed(200 mg/kg)

T4: Vit.E (150 mg/kg)                      T5: Vit.E (200 mg/kg)

**Table (6):** Average values ( $M \pm SE$ ) of plasma Immunoglobulin and some blood hormones of (D.N) cocks as affected by dietary Grape seed or vitamin E supplementation

<b>Treatments</b> <b>Items</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>	<b>T5</b>
<b>IgG</b> <b>ng/ml</b>	1.19 <sup>c</sup> ± 0.03	1.94 <sup>b</sup> ± 0.12	3.04 <sup>a</sup> ± 0.12	1.93 <sup>c</sup> ± 0.17	2.04 <sup>ab</sup> ± 0.11
<b>IgM</b> <b>ng/ml</b>	0.76 <sup>c</sup> ± 0.07	1.34 <sup>b</sup> ±0.05	1.76 <sup>a</sup> ± 0.04	0.86 <sup>c</sup> ± 0.06	1.47 <sup>ab</sup> ± 0.08
<b>Testosterone</b> <b>ng ml</b>	1.16 <sup>c</sup> ± 0.03	1.89 <sup>b</sup> ± 0.13	2.72 <sup>a</sup> ± 0.06	1.65 <sup>b</sup> ± 0.08	2.58 <sup>a</sup> ± 0.12
<b>T<sub>3</sub></b> <b>ng/ml</b>	1.74 <sup>d</sup> ± 0.12	2.35 <sup>c</sup> ± 0.05	3.49 <sup>a</sup> ± 0.11	2.25 <sup>c</sup> ± 0.05	3.11 <sup>b</sup> ± 0.01
<b>T<sub>4</sub></b> <b>ng/ml</b>	13.53 <sup>e</sup> ± 0.47	18.35 <sup>c</sup> ± 0.57	21.54 <sup>a</sup> ± 0.46	15.82 <sup>d</sup> ± 0.34	19.79 <sup>b</sup> ± 0.26

a, b, c,d,e = Means in the same row within each parameter differently superscripted are significantly different ( $p \leq 0.05$ )

T1: Control

T2: Grape seed(100 mg/kg)

T3: Grape seed(200 mg/kg)

T4: Vit.E (150 mg/kg)

T5: Vit.E (200 mg/kg)

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### الملخص العربي

## تأثير اضافة مستخلص بذر العنب أو فيتامين هـ كمضادات للأكسدة على الأداء التناسلى والفسيوولوجى أثناء فصل الصيف على 2- ذكور الدجاج المحلى المتقدم فى العمر.

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أجريت هذه الدراسة فى محطة بحوث الإنتاج الحيوانى سدس بنى بسوف-معهد بحوث الإنتاج الحيوانى بهدف دراسة تأثير اضافة مستويات مختلفة من مستخلص بذور العنب أو فيتامين هـ إلى العليقة الأساسية (تحتوى على 10 مللجرام من فيتامين هـ /كيلوجرام علف) على الأداء الفسيولوجى والتناسلى لذكور دجاج الدندراوى المتقدم فى العمر والمرباة تحت ظروف الجو الحار حيث تصل درجة الحرارة إلى 37 درجة مئوية خلال أشهر الصيف ودرجة الرطوبة النسبية 65%. استخدم فى هذه الدراسة عدد 150 دجاجة و 30 ديك من سلالة دندراوى ( عمر 60 أسبوع وقسمت عشوائياً إلى خمس مجموعات متساوية العدد (30 دجاجة و 6 ديوك/ مجموعة) وكل مجموعة تم تقسيمها إلى ست مكررات متساوية العدد ( 5 دجاجات و 1 ديك /مكررة) وتم تغذية المجموعات الخمس كالتالى:

المعاملة الأولى: (كنترول) تتغذى فيها الطيور على العليقة الأساسية بدون اضافة (تحتوى على 10 مللجرام فيتامين هـ / كيلوجرام علف). المعاملة الثانية: تتغذى فيها الطيور على العليقة الأساسية مضاف إليها مستخلص بذور العنب (بمعدل 100 مللجرام / كجم عليقة). المعاملة الثالثة: تتغذى فيها الطيور على العليقة الأساسية مضاف إليها مستخلص بذور العنب (بمعدل 200 مللجرام / كجم عليقة). المعاملة الرابعة: تتغذى فيها الطيور على العليقة الأساسية مضاف إليها فيتامين هـ (بمعدل 150 مللجرام / كجمعليقة). المعاملة الخامسة: تتغذى فيها الطيور على العليقة الأساسية مضاف إليها فيتامين هـ (بمعدل 200 مللجرام / كجم عليقة). استمرت التجربة حتى عمر 72 اسبوع وتتلخص أهم النتائج المتحصل عليها فيمايلى: اضافة مستخلص بذور العنب او فيتامين هأدى إلى زيادة فى وزن الجسم بصورة غير معنوية ولم يتأثر معنوياً كمية العلف المستهلك لديوك الدندراوى. حدث تحسين فى الصفات الفيزيائية للسائل المنوى لديوك الدندراوى بصورة معنوية عند مستوى 0,05، كذلك هناك زيادة معنوية عند مستوى 0,05 فى نسبة الخصوبة والفقس، كما تلاحظ انخفاض مستوى الدم من الجلوسريدات الثلاثية والكولستيرول منخفض الكثافة و الجلوكوز و المألون داي الديهاليد (MDA) فى حين ارتفع مستوى البروتين الكلى والألبومين والكولستيرول عالى الكثافة وتفق معنوى ( $p \leq 0.05$ ) فى نشاط انزيم الجلوتاثيون بيروكسيديز والسوبر أوكسايد عند اضافة مستخلص بذر العنب أو فيتامين هـ إلى عليقة ديوك الدندراوى المتقدم فى العمر بالمقارنة بمجموعة المقارنة. كان هناك اختلافات معنوية للمعاملات المختلفة فى قيم IgG, IgM وسجلت المجاميع المغذاه على 200 ملجم مستخلص بذر العنب / كجم علف أفضل قيمة. كذلك أدى استخدام مستخلص بذر العنب أو فيتامين هـ عند المستوى المرتفع 200 ملجم/ كجم علف زيادة فى مستوى هرمون التوستيسترون و T3 و T4 فى سيرم الدم.

يستنتج من الدراسة أن اضافة 100 و 200 ملجم/كجم علف منمستخلص بذور العنب أو 150 و 200 ملجم/كجم علف فيتامين هـ لعليقة ديوك الدندراوى المتقدم فى العمر يمكن أن يكون له دور وقائى للتأثيرات السلبية الناتجة عن ارتفاع درجة حرارة البيئة المحيطة بالطيور خلال أشهر الصيف كما يؤدى إلى تحسين جودة السائل المنوى والخصوبة والفقس وخصائص الدم والإستجابة المناعية للدجاج. وكان المستوى المرتفع 200 ملجم/كجم سواء مستخلص بذر العنب أو فيتامين هأكثر فاعلية من المستوى المنخفض.