

## **EFFECT OF SOME ANTIBIOTICS ON REPRODUCTIVE PERFORMANCE, BLOOD CONSTITUENTS AND ORGANS-HISTOPATHOLOGY OF BAUSCAT BUCK RABBITS.**

**S. A. Gad Alla<sup>1</sup>; Y.E. El-Bolkiny<sup>2</sup>; Merveet A. Mansor<sup>2</sup> and Nubile E. El-Kasas<sup>1</sup>**

<sup>1</sup>*Animal Production Research Institute, Agricultural Research Center, Gaza, Egypt.*

<sup>2</sup>*Department of Zoology, Faculty of Science, Tanta University, Tanta, Egypt.*

### **ABSTRACT**

*Thirty six Basket buck rabbits, 6 months of age with an average initial body weight, 2835 ± 44.58 g were randomly allotted into three experimental groups (N= 12) based on body weight. The 1<sup>st</sup> group was used as control and injected with saline solution (1 ml of 0.09 % NaCL). The 2<sup>nd</sup> and 3<sup>rd</sup> groups were injected subcutaneous with 2.5 mg of each tetracycline and enrofloxacin per kg live body weight biweekly for 10 weeks, respectively. Semen samples were individually collected from the five bucks once weekly for a period of 10 weeks to evaluate semen quality. Blood samples from five Basket buck rabbits in each experimental group were collected biweekly throughout the experimental period, also blood parameters were studied. At the end of experiment, three bucks from each experimental groups were randomly chosen and slaughtered to study the histopathological examination. Specimens of liver, kidneys and testes were taken from each animal for the histopathological investigation.*

*The present results showed that the live body weight and the relative weight of liver, testes and epididymis was not affected significantly by injection with tetracycline or enrofloxacin. However, the relative weight of kidney of bucks which treated with tetracycline and enrofloxacin increased significantly ( $P < 0.05$ ) as compared with the control group. The treatment of bucks with tetracycline or enrofloxacin decreased insignificantly the total number of RBCs and WBCs as compared with the control group. The total number of platelets were decreased ( $P < 0.05$ ) in rabbits treated with tetracycline and increased ( $P < 0.05$ ) in which treated with enrofloxacin. After treatment with tetracycline and enrofloxacin, the mean concentration of hemoglobin (Hb) and packed cell volume (PCV) were similarly with control.*

*The total protein, globuline, bilirubin levels and createnin were decreased ( $P < 0.05$ ) with rabbits treated with tetracycline or enrofloxacin compared to the control group. However, albumin, albumin / globuline (A/G) ratio and the plasma urea -N concentrations were similar in both treated with tetracycline or enrofloxacin and control groups.*

*Injection of bucks with tetracycline induced ( $P < 0.05$ ) reduction of plasma AST activity and increased ( $P < 0.05$ ) of plasma ALT activity.*

However, injection of rabbits with enrofloxacin decreased ( $P < 0.05$ ) of plasma AST and ALT activity as compared with the control group. The testosterone hormone was increased significantly after injection rabbits with tetracycline or enrofloxacin groups as compared with the control group.

Gross and microscopic examination of kidney, liver and testicular of Bauscat buck rabbits showed that injection with tetracycline or enrofloxacin had no adverse effect on these organs, which appeared histopathologically similar to those of the control rabbits. All physical semen characteristics improved significantly ( $P < 0.01$ ) for treated rabbits with tetracycline or enrofloxacin compared to the control group. However, the ejaculate volume were not affected significantly by treated with both drugs.

**Key words:** Tetracycline, enrofloxacin, and physical semen traits, blood components, organs-histopathology.

## INTRODUCTION

Rabbits can be driven to health problems and mortality due to an imbalance of the digestive flora, under the influence of environmental factors. In order to prevent this health problems several products are available on the market and some are employed more or less extensively in the practice.

Antibiotic is a group of chemical compounds produced biologically by certain microorganisms which possess bactericidal effects. Antibiotics are added to feed of several classes of livestock to prevent or control diseases, to stimulate growth and improve feed efficiency (Miles *et al.*, 1984). Antibiotics have been used widely as growth promoters particularly of antimicrobial properties (El-Sherbiny *et al.*, 1990; Dorgham *et al.*, 1994 and Radwan *et al.*, 1996). Among the wide range of antibiotics which has been tested tetracycline or enrofloxacin used on a preventive or on a curative basis.

Tetracycline known as the broad spectrum antibiotics because they have their effect on gram positive and negative bacteria, as well as, a few non bacterial species. It had protective effects against chronic aflatoxicosis enhanced by cysteine and methionine in rabbits (Clark *et al.*, 1982). Also, due to chelating properties of tetracycline it has been used as *in vivo* indicator of new bone formation because it forms complexes with mineral at bone forming surfaces (Moalli *et al.*, 1994).

Enrofloxacin is a broad spectrum from fluoroquinolone antibiotics. It is routinely used to treat bacterial infections (Verma *et al.*, 1999 and Oluch *et al.*, 2001). It has the highest efficacy against canine *E coli* isolates from dogs. Also, Lautzenhiser *et al.* (2001) studied the effect of enrofloxacin and ciprofloxacin against *E coli* and staphylococcal isolated from dogs and the *in vivo* transformation of enrofloxacin to ciprofloxacin may enhance the efficacy of enrofloxacin.

Therefore, the aim of the present study to investigate the effect of injection of some antibiotics (tetracycline and enrofloxacin) subcutaneously on reproductive

performance, some blood constituents and organs- histobathology of Bauscat buck rabbits.

## MATERIALS AND METHODS

The experimental and laboratory works of the present study were carried out at El-Gemeza Experimental Station, Animal Production, Research Institute, Ministry of Agriculture, Egypt, at March, 2002 and extended for 10 weeks.

The present study lasted 10 weeks in order to evaluate the effects of injection of some antibiotics (tetracycline and enrofloxacin) subcutaneously on reproductive performance, some blood constituents and organs- histopathology of Basket male rabbits. For this purpose, thirty six Bauscat buck rabbits, 6 months of age with an average initial body weight,  $2835 \pm 44.58$  g were randomly allotted into three experimental groups (N= 12) based on body weight. The 1<sup>st</sup> group was used as control and injected with saline solution (1 ml of 0.09 % NaCL). The 2<sup>nd</sup> and 3<sup>rd</sup> groups were injected subcutaneous with 2.5 mg of each tetracycline ( 1 ml of an injectable solution contained 2mg tetracycline that manufactured by Pfizer Co. Cairo, Egypt) and enrofloxacin (1 ml of an injectable solution contained 2mg enrofloxacin that manufactured by Alexandria Co. for Pharmaceuticals, Alexandria, Egypt.) per kg live body weight biweekly for 10 weeks, respectively.

The rabbits were housed individually in wire cages (60 x 55 x 40 cm) provided with galvanized feeders and nipple drinkers. Fresh drinking water were available all time. The animals were kept under the same environmental and managerial conditions. The basal ration was formulated in one of feed mills to meet the nutrient requirements of rabbits according to NRC (1977). The ration was offered to rabbits *ad libitum*. The ingredients and chemical composition of the pelleted ration are shown in Table (1).

Five Bauscat buck rabbits were randomly chosen from each experimental group. Semen samples were individually collected from the bucks once weekly for a period of 10 weeks by using an artificial vagina. Semen quality of bucks was determined including ejaculate volume (ml), wave motion (scores), sperm motility (%), sperm concentration ( $\times 10^6$ /ml), dead and abnormal spermatozoa (%) as described by El-Gaafary (1987) and El-Kelawy (1993).

Blood samples from five bucks in each experimental group were collected biweekly throughout the experimental period. At each collection 5 ml of blood were drained and divided into two tubes. The 1<sup>st</sup> tube was without heparine and the 2<sup>nd</sup> sample was placed into heprinized tube.

Blood samples were without heparin were immediately centrifugation at 3000 r.p.m. for 15 minutes and stored frozen ( $-20^{\circ}\text{C}$ ) in plastic vials until performance of the biochemical tests. Levels of serum total protein and albumen was determined according to Henery (1964) using commercial kits obtained from Diamond Diagnostics. The globulin values were obtained by substracting the values of albumin from the total

protein and the values of A/G ratio was also calculated. Urea-N, creatinine and total bilirubin concentration was determined by using commercial Kits of Diamond Diagnostics according to the method of Henery (1974). The activity of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) was assayed according to the method described by Reitman and Frankel (1957). The levels of serum blood testosterone was also determined by radioimmunoassay technique, according to the method described by Jaffe and Behrman (1974) and Wilson *et al.* (1992) using coated kits purchased from Diagnostic Products Corporation Kits, Los Angeles, U.S.A.

At the end of experiment, three bucks from each experimental groups were randomly chosen and slaughtered to study the histopathological examination. Specimens of liver, kidneys and testes were taken from each animal for the histopathological investigation. The specimens were fixed in a 10 % formalin saline, embedded in paraffin wax and sectioned at 5 microns thickness sections which stained with hematoxylin and eosin (Carleton, 1967).

Data of the experiment were statistically analyzed according to Snedcor and Cochran (1982), using SPSS (1998). The differences between means were tested using Duncan's New Multiple Rang Test (Duncan,1955).

**Tble (1): Ingreadients and chemical composition of the pelleted rations.**

<b>Items</b>	<b>%</b>
<b>Ingreadients :</b>	
Barley grains (ground)	12.50
Wheat bran	25.00
Yellow corn (ground )	10.00
Soybean meal (44%)	15.00
Clover hay (ground)	32.50
Molasses	3.00
Limestone	1.00
Vit. & Min.primix	0.50
Common salt	0.35
DL-Methionine	0.15
Total	100.00
<b>Chemical composition:</b>	
Dry matter	90.07
Crude protein	16.95
Ether extract	2.77
Crude fiber	12.01
Nitrogen free extract	50.75
Ash	7.59

\* Each kg of vitamin and mineral provides: 4.000.000 Vit A, 5000.000 IU Vit D,16.7g Vit E, 0.67g Vit K, 0.67g Vit B<sub>1</sub>, 2.0 g Vit B<sub>2</sub>, 0.67g B<sub>6</sub>, 0.004g Vit B<sub>12</sub>, 16.7g Niacin, 6.67 Pantothenic acid, 0.07g Biotine, 1.67 g Folic acid, 400 g Choline chloride, 23.3g Zn, 10g Mn, 25 g Fe, 1.67g Cu, 0.25g I, 0.033g Se and 1.33 g Mg.

## RESULTS AND DISCUSSION

### Effect of tetracycline and enrofloxacin on: Body weight and relative weight of organs:

Data in Table 2 showed that the live body weight was not affected significantly ( $P < 0.05$ ) by injection with tetracycline or enrofloxacin. Moreover, the relative weight of liver, testes and epididymis showed insignificant differences between treated groups with tetracycline or enrofloxacin and untreated group (control). However, the relative weight of kidney of Bauscat buck rabbits which treated with tetracycline and enrofloxacin increased significantly ( $P < 0.05$ ) as compared with the corresponding value of the untreated group. Similar results were reported by Abdel-Lateef *et al.* (1998) and El-Banna and Ibrahim (1999) on body weight and Izat *et al.* (1989) on the relative weight of investigated organs (Liver, kidney and testes).

**Table 2. Effect of tetracycline and enrofloxacin on body weight and relative weight of some organs ( $X \pm SE$ ) of Bauscat buck rabbits**

Items	Experimental groups			Sig.
	A (Control)	B	C	
<b>Body weight</b>	3253.33±251.48	3013±240.04	3153.33±223.41	N.S.
<b>Relative weight of organs:</b>				
<b>Liver</b>	2.28±0.20	2.13±0.08	2.11±0.14	N.S.
<b>Kidney</b>	0.45±0.01 <sup>a</sup>	0.47±0.01 <sup>ab</sup>	0.49±0.01 <sup>b</sup>	*
<b>Testes</b>	0.154±0.01	0.140±0.02	0.156±0.01	N.S.
<b>Epididymis</b>	0.040±0.01	0.040±0.01	0.05±0.003	N.S.

Means in the same row having different letters are significantly differ, ( $P < 0.05$ ).

\* =  $P < 0.05$ , N.S= Not significant.

### ***Effect of tetracycline and enrofloxacin on the blood count:***

The results in Table 3 showed that the treatment of Bauscat buck rabbits with 2.5 mg tetracycline or enrofloxacin decreased insignificantly the total number of RBCs as compared with the control group. Also, WBCs was not affected significantly by the treatment with both drugs. On the other hand, the total number of platelets were decreased significantly ( $P < 0.05$ ) in Bauscat buck rabbits treated with 2.5 mg tetracycline and increased ( $P < 0.05$ ) in which treated with 2.5 mg enrofloxacin. Similar results were obtained by Flescher *et al.* (2000) found that chickens fed diet supplemented with enrofloxacin had no changes in RBCs and WBCs. However, El-Banna and Ibrahim (1999) showed that growing Bauscat rabbits fed on diet supplemented with similar antibiotics increased significantly RBCs count. However, Dniyog and Bhowmik (2003) found that broiler chickens fed with ciprofloxacin decreased significantly RBCs count at 7 days post treatment, but it had no significant effect on WBCs count indicating anaemia, which possibly resulted from either its toxic depression on bone marrow or its suppressive effect on hemopoietic tissue.

**Table 3. Effect of tetracycline and enrofloxacin on blood count and omponents (X±SE) of male Bauscat rabbits.**

Items	Experimental groups			Sig.
	A (Control)	B	C	
<b>Blood count:</b>				
Red blood cells (x 10 <sup>6</sup> /mm <sup>3</sup> )	5.09±0.38	5.07±0.39	4.67±0.33	N.S.
White blood cells (x 10 <sup>3</sup> /mm <sup>3</sup> )	7.39±0.74	9.79±1.90	8.80±1.70	N.S.
Platelet (x 10 <sup>4</sup> /mm <sup>3</sup> )	13.97±1.21 <sup>b</sup>	7.99±1.19 <sup>a</sup>	19.38±1.10 <sup>c</sup>	*
Hemoglobin (g %)	12.1±0.27	12.45±0.31	12.11±0.24	N.S.
Packed cell volume (%)	35.65±1.40	43.47±0.72	36.32±1.80	N.S.
<b>Serum biological synthetic:</b>				
Total protein (g/dl)	8.84±0.40 <sup>b</sup>	7.90±0.48 <sup>a</sup>	8.53±0.51 <sup>ab</sup>	*
Albumin (g/dl)	4.14±0.32	4.57±0.27	4.83±0.21	N.S.
Globulin (g/dl)	4.70±0.50 <sup>b</sup>	3.33±0.40 <sup>a</sup>	3.70±0.60 <sup>a</sup>	*
Albumin/ Globulin ratio	2.03±0.20	2.80±0.90	2.40±0.34	N.S.
Bilirubin (mg/dl)	0.30±0.15 <sup>b</sup>	0.26±0.05 <sup>ab</sup>	0.22±0.05 <sup>a</sup>	*
<b>Kigney function:</b>				
Urea- N(mg/dl)	63.70±4.62	61.21±5.08	63.93±4.65	N.S.
Creatinine (mg/dl)	1.04±0.20 <sup>b</sup>	0.82±0.17 <sup>ab</sup>	0.77±0.16 <sup>a</sup>	*
<b>Liver function:</b>				
AST (μ /L)	8.23±0.80 <sup>b</sup>	5.68±0.84 <sup>a</sup>	7.94±0.90 <sup>b</sup>	*
ALT (μ /L)	6.90±0.70 <sup>a</sup>	7.37±0.72 <sup>b</sup>	6.21±0.80 <sup>a</sup>	*
<b>Serumtestosterone (ng/L)</b>	3.2±0.12 <sup>a</sup>	5.83±0.20 <sup>c</sup>	4.80±0.12 <sup>b</sup>	*

Means in the same row having different letters are significantly differ, (P<0.05).

\* = P< 0.05, N.S= Not significant.

After treatment with tetracycline and enrofloxacin, the mean concentration of hemoglobin (Hb) and packed cell volume (PCV) were similarly with untreated group (control). Flescher *et al.* (2000) reported that chickens fed a diet supplemented with enrofloxacin had a significant (P < 0.01) increase in HB, but no significant effect on PCV. On the other hand, Dniyog and Bhowmik (2003) found that broiler chickens that fed with ciprofloxacin led to a significant decrease in Hb and PCV at 7 and 14 days post treatment. However, El-Banna and Ibrahim (1999) showed that the feeding growing rabbits with such antibiotics increased significantly the Hb and PCV values.

#### **Serum biological synthetic activity:**

The present results in Table 3 showed that the total protein, globuline and bilirubin levels were decreased significantly (P < 0.05) with Bauscat rabbits treated with tetracycline or enrofloxacin compared to the corresponding values of the control group. However, albumin and albumin/globuline (A/G) ratio were not affected significantly by treatment with both drugs. El-Tantawy *et al.* (2001) found that total protein, albumin and globulin levels were increased significantly in Bauscat rabbits supplemented with

flavomycine than the corresponding values of the untreated group (control). El-Yamany *et al.* (1999) found that oxytetracycline led no effect on total protein, albumin, globulin and A/G ratio of one-day old ducks. Oppositly, Dniyog and Bhowmik (2003) found that plasma total protein and A/G ratio were significantly decreased in chickens treated with ciprofloxacin.

The present results showed that either tetracycline or enrofloxacin tend to decrease the proteins fractions and it was possible because of its decreased synthesis by degenerated and/or necrotic liver resulting in low protein level in blood. It is possible because of decreased in glucose level by gluconeogenesis and this leads to loss of plasma proteins. On the other hand, both drugs increased the plasma level of the protein fractions and this result could be interpreted on this basis of little hepatocyte degeneration, which led to leakage of protein into circulation.

#### ***Kidney functions:***

The present data showed that the plasma urea –N concentrations were similar in both treated bucks with tetracycline or enrofloxacin and untreated group (control). However, creatinin concentrations decreased significantly ( $P < 0.05$ ) of treated bucks with both drugs as compared with the corresponding values of the control group (Table 3). Similar results were reported by El-Koly and El-Hady (1996) reported that treatment with flavomycine had no effect on plasma urea-N and creatinine concentrations of buffaloes and Friesian calves. However, El-Amary *et al.* (2001) showed that the effect of avoparcin increased the plasma urea-N concentration after feeding of sheep with 0.75 mg/day. Also, El-Banna and Ibrahim (1999) found that urea-N and creatinine levels of growing Bauscat rabbits supplemented with verginiamycine were decreased significantly.

Gross and microscopic examination of kidney of bucks showed that injection with tetracycline or enrofloxacin had no adverse effect on the kidney, which appeared histopathologically similar to those of the control rabbits. Tissue examination with a light microscopy revealed that there was no any change in the kidney section of rabbits treated with either tetracycline or enrofloxacin (Figure 1). The microscopic examination of kidney of male Bauscat rabbits reflected a normal appearance without pathological observations. The renal corpuscle consists of a well developed glomerulus and a prominent Bowman's capsule. Also, the renal tubules appeared with normal epithelia in both the cortical and outer meullar regions, except some lymphocitic infiltration and mild tubular degeneration.

#### ***Liver functions:***

Injection of Basket buck rabbits with tetracycline induced a significantly ( $P < 0.05$ ) reduction of plasma AST activity and increased significantly ( $P < 0.05$ ) of plasma ALT activity. However, injection of bucks with enrofloxacin decreased significantly ( $P < 0.05$ ) of plasma AST and ALT activity as compared with the

**A****B****C**

**Figure 1. Cross section in kidney of bucks injected with tetracycline (A) and enrofloxacin (B) as compared with untreated (C).**



corresponding values of the control group (Table 3). Dniyog and Bhowmik (2003) showed that ciprofloxacin had corresponding values of the control group (Table 3). Dniyog and Bhowmik (2003) showed that ciprofloxacin had significant increase of serum AST and ALT for broiler chickens. El-Tantawy *et al.* (2001) found that serum AST and ALT of bucks were not affected significantly by treatment with flavomycine.

Gross and microscopic examination of liver of bucks showed that injection with tetracycline or enrofloxacin had no adverse effect on the liver, which appeared histopathologically similar to those of the control rabbits. Microscopic examination revealed that the liver contains normal hepatic lobules with normal hepatic cell strands enclosing a central vein and normal appearance (Figure 2). Moreover, hepatocytes appeared with more intense eosinophilic cytoplasm and plastic regenerative in some slide and mild degeneration. These findings were in agreement with the results of the blood serum analysis (Table 3), which revealed normal liver functions of rabbits injected with tetracycline or enrofloxacin compared to the control.

#### ***Serum testosterone levels:***

The present data showed that testosterone hormone was increased significantly after injection with tetracycline or enrofloxacin in bucks as compared with the control group (Table 3). The lack effect of ciprofloxacin on circulating testosterone concentration may indicate that ciprofloxacin is a relatively selective inhibitor of mixed-function oxidase activity, affecting the activities of enzymes involved in the metabolism of substrates such as theophylline and antipyrine, but not the activities of those involved in testosterone synthesis. Ciprofloxacin may inhibit both the synthesis and degeneration of testosterone, resulting in little or no effect of circulating testosterone concentration. An analysis of testosterone precursor and metabolite concentration profiles would determine where this is a viable explanation. It is also possible that poor penetration of ciprofloxacin into the testes, the primary site of testosterone production, accounts for lack of effect on testosterone concentration.

#### ***Testicular histopathology:***

Gross and microscopic examination of testicular of bucks showed that injection with 2.5 mg tetracycline or enrofloxacin had no adverse effect on the testes, which appeared histopathologically similar to those of the control rabbits. Microscopic examination revealed that there were no changes in the testis section of rabbit treated with either tetracycline or enrofloxacin (Figure 3). The normal testis which contains the wall of seminiferous tubules is well developed and consists of different layers of normal spermatocytes at different stages of development. The nuclei of Sertoli cell often appear mid-way between the basement membranes of the seminiferous tubules and their lumina. The interstitial cells are appeared normal and seem to be surrounded by testicular lymph.

**A****B****C**

**Figure 2. Cross section in liver of bucks injected with tetracycline (A) and enrofloxacin (B) as compared with untreated (C).**

**A**

**B**

**C**

**Figure 3. Cross section in testes of bucks injected with tetracycline (A) and enrofloxacin (B) as compared with untreated (C).**

**Physical semen characteristics:**

Adverse effect of antibiotic agents on spermatogenesis or sperm functions have been demonstrated in animals and man (Dukes and Elis, 1982). In the present study all physical semen characteristics were improved significantly ( $P < 0.01$ ) for treated bucks with tetracycline or enrofloxacin compared to the control group (Table 4). However, the ejaculate volume were not affected significantly by treated with both drugs. The obtained results cleared that treatment with either tetracycline or enrofloxacin tend to enhance the sperm motility, and total sperm output. On the contrary, these drugs significantly decreased the percentage of dead and abnormal spermatozoa. In similar study, Abbitt *et al.* (1984), Barth and Wood (1998) and Verma *et al.* (1999) concluded that the ejaculate volume of semen did not change in beef bulls injected with either tetracycline or enrofloxacin. Abdel-Malak *et al.* (1999) found that oxytetracycline injection to Barki rams had no any significant changes in the percentage of live spermatozoa, which proved that oxytetracycline in therapeutic dose did not evoke any toxic effect on ram spermatozoa (Fattouh *et al.*, 1991).

**Table 4. Effect of tetracycline and enrofloxacin on physical semen characteristics ( $\bar{X} \pm SE$ ) of Basket buck rabbits**

Items	Experimental groups			Sig.
	A (Control)	B	C	
No. of ejaculate	50	50	50	
Ejaculate volume (ml)	0.76 $\pm$ 0.13	0.91 $\pm$ 0.12	1.06 $\pm$ 0.33	N.S.
Wave motion (Score)	3.62 $\pm$ 0.19 <sup>a</sup>	3.91 $\pm$ 0.14 <sup>b</sup>	4.13 $\pm$ 0.14 <sup>b</sup>	**
Sperm motility (%)	70.60 $\pm$ 3.40 <sup>a</sup>	78.40 $\pm$ 2.40 <sup>b</sup>	82.2 $\pm$ 2.72 <sup>b</sup>	**
Dead spermatozoa (%)	9.50 $\pm$ 0.94 <sup>c</sup>	6.50 $\pm$ 0.71 <sup>b</sup>	4.70 $\pm$ 0.70 <sup>a</sup>	**
Abnormal spermatozoa (%)	19.90 $\pm$ 0.77 <sup>b</sup>	13.30 $\pm$ 1.60 <sup>a</sup>	10.10 $\pm$ 1.30 <sup>a</sup>	**
Sperm concentration ( $\times 10^6$ /ml)	289.3 $\pm$ 18.92 <sup>a</sup>	268.1 $\pm$ 12.35 <sup>a</sup>	329.5 $\pm$ 27.41 <sup>b</sup>	**
Total sperm output ( $\times 10^6$ )	219.8 $\pm$ 19.60 <sup>a</sup>	243.9 $\pm$ 28.90 <sup>ab</sup>	349.3 $\pm$ 40.41 <sup>b</sup>	*

Means in the same row having different letters are significantly differ, ( $P < 0.05$ ).

\*\* =  $P < 0.01$ , \* =  $P < 0.05$ , N.S= Not significant.

**In conclusion**, the present results showed that injection of either of tetracycline or enrofloxacin with dose of 2.5 mg dose not change physiological and semen quality as growth promoters. Therefore, it can be recommended that administration in low dose but precautions should be taken to avoid over use, under environmental Egyptian conditions..

## REFERENCES

- Abbitt, B.; Bendtson, W. E. and Seidel, G. E. (1984).** Effect of dihydrostreptomycin or oxytertracycline on reproductive capacity of bulls. *Am. J. Vet. Res.*, 2243-2245.
- Abdel-Lateef, A. M. (1998).** Lactosac and virginiamycin supplementation for growing rabbits, undersubtropical conditions. M.Sc. Thesis, Fac. Agric. Fayom, Cairo University, Egypt.
- Abdel-Malak, M., El-Sheltawi, M. A. ; Hassan, H. M. ; Abdel Malak, G. and Mettias, K. N. (1999).** Untoward effects of oxytetracycline on reproductive capacity of Barki rams . *Assiut Vet. Med.*, 333-343.
- Barth, A. D. and Wood, M. R. (1998) .** The effect of streptomycin, oxytetracyclin in bull. *Can. Vet. J.*, **39** (2): 103-106.
- Carleton, L.(1967).** *Histopatological Technique*. 4<sup>th</sup> Edition. Oxford University Press, New York.
- Clark, J. D.; Jain, A. V. and Hatch, R. C. (1982).** Effects of various treatments on induced chronic aflatoxicosis in rabbits. *Am. J. Vet. Res.*, **43** (1): 106-110.
- Dniyog, S.and Bhowmik, M. K. (2003).** Toxicopathological changes of ciprofloxacin in broiler chickens. *Indian Journal of Animal Sciences*, **73** (1): 12-15.
- Dorgham, S. M.; Sabry, H. M. and El-Sheikh, M. A. (1994).** Influence of fermavergini. Egg-plus as growth promoters and their synergetic effects on laying hen performance. Proceeding of 2<sup>nd</sup> Scientific Conference on Poultry, Kafr El-Sheikh, Egypt, **12-13**: 184-195.
- Dukes, M. N. G. and Elis, J. (1982).** *Side effect of drugs*. Annual 6 Awarledwide yearly survey of new data and trends. Excerptat. Medic., Amsterdam, oxford-Princeton.
- Duncan, D.B. (1955).** Multiple Range and Multiple F-Test. *Biometrics*, **11**: 1- 42.
- El-Amary, A.; Hanna, S. and Deraz, T. (2001).** Effect of avaparcin supplement on digestion N-balance and some rumen and blood serum parameters of sheep. *J. Agric. Sci. mansoura Univ.*, **26** (8): 4755-4763.
- El-Banna, H. A. and Ibrahim, Sh., A. (1999).** Diclazuni interaction with avoparcin and virginiamycin as growth promoters in growing rabbits. *Vet. Med. J., Giza*, **47** (4): 445-455.
- El-Gaafary, M. N. (1987).** The characteristics of semen from Welsh Mountain and Cambridge rams. Ph.D. Thesis, College of North Wales, Bangor, UK.
- El-Kelawy, H. M. (1993).** Studies on reproductive and productive performance in rabbits. Ph.D. Thesis Agric.Fac., Zagazig Univ., Zagazig, Egypt
- El-Koly, A. F. and El-Hady, M. A. (1996).** Effect of flaviomycine on the performance and blood constituents of Frisian and buffalo calves. *Vet. Med. J. Giza*, **144** (1): 101-107.

- El-Sherbiny, A. E.; El-Samra, S. H.; Raafat, M. A. and El-Nagmy, K. Y.(1990).** Antibiotics as growth promoters in broiler ration. 2. Effect of flavomycin or zinc bacitracin supplements on dressing, giblet, intestinal weight and plasma protein contents. *J. Agric. Sci. Mansoura Univ.*, **15**: 399-405.
- El-Tantawy, S. M. T., Samia, Z. Meshreky; Fadia Nosseir, M. and Hanna. M.F.S. (2001).** Effect of some feed additives on 2. Reproductive performance and some blood hormones of Bauscat rabbits. *Egyptian J. Nutrition*, 23-26. Sharm El-Sheikh, Egypt.
- El-Yamany.A.T.; Maghraby, S. A.; Yassein and Samy, M. S. M. (1999).** Effect of some antibiotics and blood constituents of two strains of ducks. *J. Agric.Sci., Mansoura Univ.*, **24**(8): 2825-2842.
- Fattouh, El.S. M. ; Ghoncin, I. M., Soliman, G.A. and Hussinen, H. S. (1991).** Oxytetracycline disposition in buck semen and its effect on semen quality. Egyptian Soc. Anim. Reprod. Fert. Third Annual Congress, Cairo, 12-14.
- Flescher, L. G. ; Gerber, G.; Liezenga, R.W. Lippert, E. ; Scholl, M. A. and Westpha, L.G. (2000).** Blood cells and plasma proteins of chickens fed a diet supplemented with (1->3), (->6)- beta D-glucan and enrofloxacin. *Arch Tierernahr*, **53**(1): 59-73.
- Henery, R.J. (1964).** *Clinical Chemistry*. Harper and Row Publishers. New York pp. 181.
- Henery, R.J. (1974).** *Clinical Chemistry, Principles and Techiques*. 2<sup>nd</sup> edition,Harper and Row, p. 525.
- Izat, A. L.; Thomas, R. A. and Adams, M. H. (1989).** Effect of dietary antibiotics treatment on yield of commercial broilers. *Poultry Science*, **68**: 651-655.
- Jaffe, B.M. and Behrman, N.R.(1974).** *Method of hormone radioimmunoassay*. Academic press.
- Lautzenhiser,S.J.; Fialkowski, J.P.; Bjorling, D. and Rosin, E. (2001).** *In vitro* antibacterial activity of enrofloxacin and siprofloxacin in combination against *Escherichia coli* and *Staphylococcal* clinical isolated from dogs. *Res. Vet.Sci.*, **70**(3): 239-241.
- Miles, R. D.; Janky, M. D. and Harms, R. H. (1984).** Verginiamycin and broiler. *Poultry Science*, **63**: 1218-1221.
- Moalli, M. R.; Dysko, R.C. ; Rush, H.G. ; Chrisp, C.E. , Decoster, J. L.; Sweet, K.A. and Goldstein, S.A.(1994).** Oxytetracycline induced nephrotoxicosis in dog after intravenous administration for experimental bone labeling. *J. Antimicrob. Chemother*, **33**(3):387-401.
- N.R.C. (1977).** *Nutrient Requirements of Rabbits*. 2<sup>nd</sup> Review. Edition. National Academy Science, USA.

- Oluch, A.O.; Kim, C.H.; Weisiger, R. M.; Koo, H.Y.; Siegel, A. M.; Campbell, K.L.; Burke, T.J.; McKiernan, B. C. and Kakoma, J.H.(2001).** Nonenteric *Scherichia coli* isolates from dogs 674 cases (1990-1998). *J. Am. Vet. Med. Assoc. Feb.*,218(3): 381-384.
- Radwan, M.S.M., Asker, N.El-Nagaar, N. and Abdel-Lateef, A. (1996).** Lacto-sacc and verginiamycin supplementation for growing rabbits under subtropical condition. *Egyptian J. of Rabbit Science*, **6**: 99-108.
- Reitman, S. and Frankle, S. (1957).** Glutamic oxaloacetic transaminase colorimetric method. *Amer,J.Clin. Path.*, **28**: 56.
- Snedecor, G.W. and Cochran, W.G. (1982).** *Statistical Methods*. 7<sup>th</sup> Edition. Iowa State. University, Press, USA.
- SPSS (1998).** *User's Guide Statistics Version, 8*. Copyright SPSS Inc. USA.
- Verma, H. K.;Pangawkar, G. R. ; Matharoo, J. S. and Spivastava, A. K. (1999).** Effect of enrofloxacin on th seminal attributes of buffalio bulls. *Indian Vet. J.* 76: 1020-1022.
- Wilson, J.D., Foster, D. W. and Williams, D. (1992).** *Textbook of Endocrinology of Ram Spermatozoa*. Small. Anim. Parc. 54: 481-486.

## تأثير بعض التتراسيكلين و الانروفلوكساسين على معدل الأداء التناسلي ومكونات الدم والتغيرات الهستولوجية في ذكور الأرانب البوسكات

صلاح عبد الحكيم جاد الله<sup>١</sup> ، يسرى السيد البلقيني<sup>٢</sup> ، ميرفت أنور منصور<sup>٢</sup> ، نبيلة السيد القصاص<sup>١</sup>

١ - معهد بحوث الإنتاج الحيواني - مركز البحوث الزراعية - وزارة الزراعة - ج.م.ع.

قسم علم الحيوان - كلية العلوم - جامعة طنطا - ج.م.ع.

استخدم في هذه الدراسة ٣٦ أرنب ذكر بوسكات عمر ٦ شهور متوسط الوزن  $44,08 \pm 28350$  جرام وزعت عشوائي في ثلاث مجموعات تجريبية (١٢ أرنب/ مجموعة). المجموعة الأولى استخدمت كمجموعة مقارنة (كنترول) حققت بمعدل ١ مل من محلول ملحي فسيولوجي ٠.٠٩% كلوريد صوديوم. المجموعة الثانية و الثالثة حققت تحت الجلد بمعدل ٢.٥ مليجرام تحت الجلد / كجم وزن حي من عقاري التتراسيكلين والانروفلوكساسين. جمعت عينات السائل المنوي أسبوعيا خلال فترة التجربة لدراسة جودة السائل المنوي . وأخذت عينات الدم من خمسة ذكور من كل مجموعة تجريبية كل أسبوعين خلال فترة الدراسة وتم قياس صفات الدم المختلفة. في نهاية التجربة كما تم ذبح ثلاث ذكور عشوائيا من كل مجموعة تجريبية لدراسة التغيرات الهستولوجية للكبد والكلى والخصيتين.

### أوضحت النتائج المتحصل عليها أن:

لم يتأثر وزن الجسم والوزن النسبي لكل من الكبد والخصيتين والبربخ معنويا بالحقن التتراسيكلين والانروفلوكساسين بينما زاد الوزن النسبي للكلية معنويا في الأرانب المعاملة بالتتراسيكلين والانروفلوكساسين مقارنة بمجموعة الكنترول. أدى الحقن بكل من التتراسيكلين والانروفلوكساسين إلى نقص غير معنوي لكل من العدد الكلي لكرات الدم الحمراء والبيضاء ، في حين نقصت معنويا الصفائح الدموية بالمعاملة التتراسيكلين والانروفلوكساسين. بينما لم يتأثر كل من الهيموجلوبين وال-PCV بالمعاملة التتراسيكلين والانروفلوكساسين. كما أدى استخدام التتراسيكلين والانروفلوكساسين إلى نقص معنوي لكل من البروتينات الكلية والبيليروبين والكرياتين مقارنة بمجموعة الكنترول بينما لم يتأثر كل من الألبومين والجلوبيولين ونسبة الألبومين/الجلوبيولين.

أدت المعاملة بالتتراسيكلين غلي حدوث نقص معنوي علي مستوى ٥% في مستوى نشاط إنزيم الكبد AST وزيادة معنوية في مستوى نشاط إنزيم الكبد ALT بينما الحقن بالانروفلوكساسين أدى إلى نقص معنوي في مستوى نشاط أنزيمات الكبد ALT & AST مقارنة بمجموعة الكنترول. أوضح الفحص الميكروسكوب أن نسيج كل من الكبد والكلية والخصيتين محتفظ بطبيعته دون أي إصابات مرضية ولا يوجد أي تأثيرات غير مرغوب فيها للمعاملة التتراسيكلين والانروفلوكساسين. تحسنت بصورة معنوية كل الصفات الطبيعية للسائل المنوي على مستوى احتمال ١% في الأرانب المعاملة التتراسيكلين والانروفلوكساسين مقارنة بمجموعة الكنترول.