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EFFECT OF INOCULATING THE FEMALE LINE OF BROILER CHICKENS WITH DIFFERENT LEVELS OF ANASTROZOLE ON SERUM PHYSIOLOGICAL PREFORMANCE

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ABSTRACT
The research took place between September 28 and November 15 at Al-Qasim Green University's chicken farm, Department of Animal Production, College of Agriculture. The purpose of this research is to determine how various doses of anastrozole affect physiological features in a female-line of broiler chickens. Twenty-four Lohmann Brown roosters were utilized in this experiment, split evenly among four different treatments. Each treatment had six duplicates, with one rooster serving as a replicate for all four treatments. As for the experimental therapies, they were as follows: First (T1) was a placebo group where the aromatase inhibitor (anastrozole) was not administered. Anastrozole capsules were dosed at 0.2 mg, 0.4 mg, and 0.6 mg in the second, third, and fourth treatments (T2, T3, and T4), one capsule per day, and the total protein and globulin concentrations were found to be significantly higher ($P \leq 0.05$) for the fourth treatment compared to the control treatment. while the results indicated a significant decrease ($P \leq 0.05$) for both cholestatic liver disease and hepatic lipid This study concludes that a 0.6 mg dosage of anastrozole has a significant impact in enhancing some physiological features of blood serum.

Keywords: aromatase inhibitor (anastrozole), total protein, globulin, cholesterol, triglycerides.

INTRODUCTION
The poultry business is vital in ensuring that people always have access to nutritious food, but it has had to overcome significant obstacles due to the growing demands placed on it (Oldenbroek and Visscher, 1994). Because of its economic benefits, such as a high rate of capital turnover and a significant contribution to satisfying the human demand for food, the chicken business is a cornerstone of the economy of many nations across the world. At 45 weeks of age, the gonads are less effective than they were at younger ages (Röhss and Silverin, 1983). It is the reproduction of roosters and the factors that affect the quality of their sperm and their ability to father offspring that have piqued the interest of (Al-Daraji, 2008; Al-Rawi et al., 2011). Studies on aging roosters have demonstrated a significant decrease in hypothalamic secretions (Vizcarra et al., 2010), which in turn leads to a decrease in pituitary follicle-stimulating hormone and luteinizing hormone synthesis and release (Röhss and Silverin, 1983). However, (Sexton et al., 1989) discovered that rooster fertility is maximum between the ages of 37 and 40 weeks. And subsequently begins to fall after that. As a result of Sertoli cell retention, fewer sperm are released into the ejaculate, leading to lower fertility (Rosenstrauch et al., 1998). And that aromatase enzyme's transformation of testosterone hormone into estrogen, blocking the production of reproductive stimulating hormones, is to blame for the decline in testosterone secretion in the testicles (Thibier and Wagner,

2002). Here, the significance of the aromatase inhibitor anastrozole becomes clear; by attaching to the iron group in the aromatase enzyme, anastrozole reduces the enzyme's efficiency (Schieweck et al., 1993).It was suggested by (Ali et al. ,2017) that aromatase inhibitors could improve male fertility in laying hens by lowering the rate at which testosterone is converted into estrogen, thereby preventing a drop in testosterone levels, and also by lowering estrogen levels, thereby stimulating production of the hormones LH and FSH. We conducted this research because no previous studies have examined the use of anastrozole as an aromatase inhibitor in roosters; specifically, we wanted to find out what doses of anastrozole would have the least adverse effect on rooster physiology.

Materials and Methods

During the dates of 9/28/2019 to 11/15/2019, researchers from Al-Qasim Green University's Department of Animal Production, College of Agriculture, and poultry field gathered data for this study. Our purpose here is to examine the effects of varying doses of anastrozole on the physiological characteristics of broiler roosters. Twenty-six Lohmann Brown roosters were utilized in the experiment, with six duplicates per treatment for the first two treatments, seven replicates per treatment for the third and fourth treatments, and one rooster per replicate for all treatments. In the experiment, the following transactions took place:

An aromatase inhibitor (anastrozole) was not administered in the first treatment (T1), which served as a control. For the subsequent three treatments (T2, T3, and T4), capsules containing 0.2 mg, 0.4 mg, and 0.6 mg of anastrozole were given to the roosters once daily; the roosters were fed a special diet according to a strict schedule (1); and the coop was illuminated continuously for 14 hours, with the lights turned off for 10 of those hours. Blood samples were taken from three randomly chosen roosters in each treatment at the conclusion of the sixth week of the trial. After drawing blood from the pterygoid vein, the samples were transferred to test tubes free of anticoagulants. Total protein was determined using the technique described by (Varley et al.,1980), glucose was determined using the method described by (Kaplan,1984), albumin was calculated using the method described by (Henry et al., 1974), and globulin was determined using the equation described by (Kaplan,1984) (Al-Omari ,2001).

Moreover, the method was used by (Richmond, 1973) to measure cholesterol concentration, by (Toro and) (Ackerman, 1975) to measure triglyceride concentration, and by (Warinch and Wood, 1995; Grundy et al., 2004; Friedewald et al., 1972) to determine high-density lipoproteins (HDL), low-density lipoproteins (LDL), and very low-density lipoprotein ALP, AST, and AST were also assessed using the technique of (Ritman and Frankel, 1957). The experimental data were analyzed using a CRD in an off-the-shelf statistical package (SPSS, 2017), and Duncan's multiple range test was used to determine if there were statistically significant variations between the means (Duncan, 1955).

Table 1: Components of the diet used in roosters feeding

Diet Components	%
Yellow corn	40
Wheat	2.3

Soybean meal	24
wheat bran	6
Sunflower oil	0.9
limestone	6
Mixture of vitamins and minerals*	2.5
table salt	0.3
Calculated chemical composition**	
Crude protein	17.7
Metabolic energy (kilo calories / kg feed)	2804
Methionine + Cysteine	0.64
Calcium	3.72
Soluble phosphorus	3.4

A mixture of vitamins and minerals, one kilogram of which contains: energy represented 4200 kilo energy/kg, crude protein 16%, crude fat 14%, calcium 15-19%, lysine 10%, phosphorus compounds 13.1%, total phosphorus 6.8%, sodium 4.8%, Chloride 5.8%, Methionine 8.55%, Methionine + Cysteine 8.56%, Threonine 0.55%, Vitamin A 575000 IU/kg, Vitamin D3 201250 IU/kg, Vitamin F 3000 mg/kg, Vitamin K3 138 mg/kg Vitamin B1 138 mg/kg Vitamin B2 345 mg/kg Niacin 1840 mg/kg Pantothenic acid 552 mg/kg Vitamin B6 184 mg/kg Folic acid 46 mg/kg Vitamin B12 1000 µg/kg Biotin 6900 micrograms / kg, choline chloride 20000 mg / kg, iron sulfate 2760 mg / kg, zinc oxide 3680 mg / kg, manganese oxide 3680 mg / kg, copper 460 mg / kg, selenium 9.2 mg / kg, iodine 50 mg / kg, Antioxidants 250 mg/kg, Maduramycin 210 mg/kg, Phytase 30000 ftu/kg, Essential oil 4000 mg/kg.

**According to the chemical analysis of the diet according to NRC (1994)

RESULTS AND DISCUSSION

Changes in glucose, total protein, albumin, and globulin concentrations caused by treating roosters of broiler moms with varying amounts of anastrozole are shown in Table 2. The concentration of globulin was clearly superior for the fourth treatment when compared to the first treatment ($P \leq 0.05$), with the fourth treatment recording 8.64 mg per 100 ml of blood compared to the control treatment (the first) but not significantly different from the second and third treatments. In terms of globulin concentration, there was no statistically significant difference between the second and third treatments, and there was also no statistically significant difference between the first control treatment and the second treatment.

Table 2. Effect of feeding thee female line of broiler roosters with different levels of anastrozole (mean ± standard error) on serum glucose, total protein, albumin, and globulin

Traits	Treatments				Sg.
100 mg/dl.	T_1	T_2	T_3	T_4	

Glucose	279.00±11.83	286.80±18.76	304.40±21.04	269.00±9.67	N.S
Total protein	6.28± 0.07^{b}	7.05±0.20 ^{ab}	7.80±0.36 ^{ab}	8.64±0.14 ^{a}	*
Albumin	3.52±0.15	3.30±0.38	3.24±0.22	2.88±0.21	N.S
Globulin	2.76±0.17^{c}	3.75±0.45 ^{bc}	4.56±0.26 ^{b}	5.76±0.20 ^{a}	*

Transactions T1, T2, T3, T4 dose anastrozole in the following ratios (0,0.2, 0.4, 0.6) mg, respectively.

* The different letters within same column indicate that there are significant differences at a significant level (P≤0.05), NS means that there are no significant differences between the treatments.

Table 3 displays the results of dosing roosters used to produce broilers with various amounts of anastrozole. Compared to the other treatments, the blood cholesterol concentration was significantly lower in the fourth treatment bird containing 0.6 mg of anastrozole (P≤0.05), but there were no other significant differences. Even while triglyceride levels were similar between treatments, HDL levels varied considerably. Treatments 1, 2, and 3 had the greatest HDL values, whereas Treatment 4 had the lowest (HDL). Serum levels of high-density lipoprotein (HDL) changed considerably between treatments, but levels of low-density lipoprotein (LDL) and very low-density lipoprotein (VLDL) did not.

Table 3. Effect of feeding the female line of broiler roosters with different levels of anastrozole (mean ± standard error) on the concentration of cholesterol, triglycerides, HDL, LDL, and VLDL in serum

Traits	Treatments				Sg.
100 mg/dl.	T_1	T_2	T_3	T_4	
Cholesterol	117.40±0.15^{a}	112.00±3.02^{a}	112.00±2.170^{a}	104.00±1.52^{b}	*
Triglycerides	86.60±0.93	85.00±1.92	84.20±5.50	83.60±4.32	N.S
HDL	84.08±1.62^{a}	83.92±1.43^{a}	84.18±2.64^{a}	72.58±2.48^{b}	*
LDL	16.00±1.70	11.08±1.43	10.98±1.84	14.70±1.89	N.S
VLDL	17.32±0.19	17.00±0.38	16.84±1.10	16.72±0.86	N.S

Transactions T1, T2, T3, T4 dose anastrozole in the following ratios (0,0.2, 0.4, 0.6) mg, respectively.

* The different letters within same column indicate that there are significant differences at a significant level (P≤0.05), NS means that there are no significant differences between the treatments.

There were no statistically significant changes between any of the experimental treatments, and the results of feeding the female line of broiler roosters with varying doses of anastrozole are summarized in Table 4.

Table 4. Effect of feeding the female line of broiler roosters with different levels of anastrozole (mean ± standard error) on serum AST, ALT and ALP levels.

Traits 100 mg/dl.	Treatments				Sg.
	T_1	T_2	T_3	T_4	
AST	375.60±19.44	335.00±89.80	439.80±33.93	309.60±126.80	N.S
ALT	19.40±4.43	25.00±4.44	17.40±2.18	17.00±3.02	N.S
ALP	190.12±59.50	229.82±81.63	139.76±53.88	224.38±93.17	N.S

Transactions T1, T2, T3, T4 dose anastrozole in the following ratios (0,0.2, 0.4, 0.6) mg, respectively.

* The different letters within same column indicate that there are significant differences at a significant level ($P \leq 0.05$), NS means that there are no significant differences between the treatments.

Total protein and globulin may have gone up because of the effect that increased testosterone has on muscle proteins, leading to increased muscular development (AL-Hisnaw et al., 2020; Robert et al., 1989). Muscle development and overall body composition were both shown to benefit from testosterone's ability to boost protein synthesis, as demonstrated by the work of Upendram et al. (2010). Table 3 shows that the presence of this significant reduction is due to the role of anastrozole in inhibiting the manufacture of cholesterol by curbing the activity of free radicals and stopping the formation of cholesterol. However, the blood content of cholesterol is affected by several factors, including additives, and the ability to absorb cholesterol is largely dependent on the nature of the materials used. By decreasing the oxidation processes of unsaturated fatty acids, the chain reaction protects against the oxidative stress caused by H2O2. In addition to its effect in lowering blood plasma cholesterol through many methods, anastrozole also protects tissues against peroxides and free radicals. Glucans and other viscous gels reduce the absorption of cholesterol and HDL by blocking the absorption of bile acids (Celik & Ozkaya, 2002). (Erkkila and Lichtenstein, 2006).

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