EFFECT OF SELENIUM NANOPARTICLES ON BROILER PRODUCTIVITY AND PHYSIOLOGICAL RESPONSE USING RADIOIMMUNOASSAY TECHNIQUE

By

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A Thesis Submitted in Partial Fulfillment
Of
The Requirements for The Degree

DOCTOR OF PHILOSOPHY
in
Agricultural Sciences
(Poultry Physiology)

Department of Poultry Production
Faculty of Agriculture
Ain Shams University

2019

Approval Sheet

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تأثير استخدام جزيئات السيلينيوم متناهية الصغر على إنتاجية بدارى اللحم والاستجابة الفسيولوجية باستخدام تقنية المناعة الإشعاعية

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كلية الزراعة
جامعة عين شمس

2019

صفحة الموافقة على الرسالة

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تاريخ المناقشة: 2019/5/4

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اســـــم الطـــالب : نور الدين جودة محمد
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تاريخ التسجيل 2016/2/15

الدراسات العليا

ختم الإجازة **أُجيزت الرسالة بتاريخ**

/ /2019

موافقة مجلس الكلية **موافقة مجلس الجامعة**

/ /2019 / /2019

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LIST OF ABBREVIATIONS

SeNPs	Selenium nano-particles
Se-Cys	Selenocysteine
Se-Met	Selenomethionine
TMSe	Trimethylselenonium
RIA	Radioimmunoassay techniques
LD50	Lethal doses for 50 % of embryos
ED	Exudative diathesis
LBW	Live Body Weight
BWG	Body Weight Gain
FCR	Feed conversion ratio
MCV	Mean Corpuscular Volume
MCH	Mean Corpuscular Hemoglobin
MCHC	Mean Corpuscular Hemoglobin concentration
T.C	Total Cholesterol
HDL	High Density Lipoprtein
LDL	Low Density Lipoprtein.
T.G	Triglycerides
GSH-Px	Glutathione Peroxidase
GSH	Glutathione reduced
GSR	Glutathione reductase
MDA	Malondialdehyde
T_3	Triiodothyronine

ABSTRACT

Nour El-Deen Goda Mohammed Abd El-Aziz Effect of Selenium Nanoparticles on Broiler Productivity and Physiological Response Using Radioimmunoassay Technique Unpublished Ph.D. Dissertation, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2019.

The present study was carried out at Poultry Production Research Farm, Poultry Research Unit, Biological Application Department, Nuclear Research Center, Egyptian Atomic Energy Authority, during the period from March to May 2017, and the chemical analysis were conducted in the Biological Applications Department laboratories, Nuclear Research Center, Egyptian Atomic Energy Authority. A total of 210 broiler breeder eggs (Habbard Star-Bro) were obtained from a local hatchery (El-Tokhy Co., New Salhia, Egypt) from a maternal flock 54 week age. Eggs were incubated at 37.8^{o}C and 60% RH. Upon arrival, the eggs were individually weighed and divided into three in ovo treatment groups. The first treatment non in ovo-injected, and considered the control group, while the second and the third treatments were in ovo injected with 100 µL of nano –Selenium(elemental selenium) with concentrations of 5, 10 ppb respectively at 14 day of incubation. The hatched chicks, from each treatment were randomly divided into two treatments , once was added 10 ppb nano -Se per kilogram ration, and the other without any additive, it had became six treatments .

Results showed that, hatchability rates were reduced significantly as influenced by different experimental treatments while body weight at hatch did not affected While live body weight and body weight gain were significantly improved in all injected and additive nano-Se groups during the experimental periods. Feed consumption increased significantly affecting by nano-Se in ovo injection and the interaction, while feed conversion ratio was improved significantly affected by feed supplementation nano-Se and improved non significantly by the

interaction and recorded 1.40 and 1.41. Nevertheless, RBCs count, WBCs count, Hb concentration, PCV%, MCV, MCH, MCHC, serum total protein, albumin, globulin levels, A/G ratio, uric acid, creatinine, cholesterols and LDL were not affected by the treatments. On the other hand, serum triglycerides decreased significantly and HDL were significantly increased in the all treatments. Serum reduced glutathione content and glutathione reductase activity were increased significantly as affected by the all treatments. Malondialdehyde content was decreased significantly as affected by the all treatments

From the previous results it could be concluded that:

Either *In ovo* injection selenium nanoparticles at the 14th day of embryogenesis or supplementation it as feed additive as well as the two routes together improve post hatch productive performance, lipid profile, antioxidant and Immunological status of broiler chicks.

Based on the present results, it is recommended to use selenium nanoparticles especially *In ovo* doses with 10ppb or *In ovo* doses with 5ppb /egg plus 10ppm per kilogram ration respectively, in order to improve productive, physiological and immunological status of hatched chicks.

AKNOWLEDGMENTS

First and foremost, all prayerful thanks are due to our generous *Allah* the most beneficent and merciful who gave me the ability to complete this work.

I had the honor to work under the supervision of **Prof. Dr.Ibrahim El-Wardany El-Sayed**, Professor of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, and deep gratitude is extended for his sincere supervision, valuable advices and help during the whole period and in revising the manuscript to be in its final form.

I wish to express my deepest thanks to **Prof. Dr. Yossry Mohammed El-Hommosany**, Professor of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, for his sincere supervision, valuable advices, continuous help, co-operation, providing the facilities and revising the manuscript.

I wish to express my deepest thanks to Co-supervisor **Prof. Dr.Magda Mostafa Wakwak,** Professor of Poultry Physiology, Biological Applications Department, Nuclear Research Center, Egyptian Atomic Energy Authority, for her sincere supervision, valuable advices, cooperation, encouragement, constant interest throughout this work and moral support during this work.

My deep gratitude is extended to **Dr. Esam Mohammed Sabic, Dr. Nashaat Said Ibrahim and Dr. Abdelmonem Eid Abdelmonem** Lecturers of Poultry Physiology, Biological Applications Department, Nuclear Research Center, Egyptian Atomic Energy Authority, for their valuable advices, co-operation, encouragement and constant interest throughout this work.