IMPROVING REPRODUCTIVE AND PRODUCTIVE PERFORMANCE OF RABBITS BY DIFFERENT PHYSIOLOGICAL METHODS

By

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B.Sc. Agric. Sc. (Animal Production), Zagazig Univ., 2002

M.Sc. Agric. Sc. (Animal Production), Seuz Canal Univ., 2008

A thesis submitted in partial fulfilment

of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Agricultural Sciences

(Poultry Physiology)

Department of Poultry Production

Faculty of Agriculture

Ain Shams University

2015

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ABSTRACT

Hasnaa Mohamed Shebl Mostafa Abaza: Improving Reproductive and Productive Performance of Rabbits by Different Physiological Methods. Unpuplished Ph.D. Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2015

An experiment was conducted to study the effect of using different physiological methods by using different levels of dietary copper and zinc sulphate on rabbit does productive, reproductive performance and some physiological traits. Atotal number of fifty, 6 months of age New Zealand white (NZW) does were distributed to fife experimental treatments (ten does each). The experimental diets were formulated to be iso-nitrogenous (18.18% cp) and iso-energetic (2656kcal DE/kg diet) in which the first was a commercial basal diet without supplementation and served as acontrol diet (control group). In the second and third diets (2 and 3 treatments) the basal diet was supplemented with zimc sulphate at 75 and 150 ppm, respectively. In the fourth and fifth diets (4 and 5 treatments) copper sulphate was added at levels of 200 and 400 ppm, respectively.

The results showed that live body weight and feed in take were improved significantly ($P \leq 0.05$) with zinc and copper sulphate compared with control group at the most periods of the experimental valva color and receptivity % were improved significantly ($P \leq 0.05$) with all treatments compared to the control diet. Litter size at tirth, litter size at weaning, litter weight at weaning and milk yield were imcresed significantly ($P \leq 0.05$) with most treatments compered to using 75ppm zinc sulphate group, hematocrit (%), naemoglobim level, RBC, and WBC's counts were increased significantly ($P \leq 0.05$) after using zinc and copper sulphate compared with control group and before treatments Also, some female sex homanes of rabbits does for example FSH, LH and progesterone levels were imcreased significantly by using two levels of zinc and copper sulphate compared with control group. It can be conduded that the use

physiological methods by using zinc and copper sulphate in diets as feed additives is recommended for best productive and reproductive performance of NZW does rabbits.

Key words: Zinc, Copper, Productive Performance, Rabbits.

ACKNOWLEDGMENT

Firstly thanks to allah The author would like to express her deepest thanks and gratitude to Prof. Dr. Ibrahim El-Wardany El-sayed, Professor of poultry physiology , poultry production Department, Faculty of Agriculture, Ain shams university for his courageous supervision , suggestion the problem , valuable guidance and complete co-operation. Grateful acknowledgment , appreciation and sincere thanks are extended to Dr. Aymen Mohamed Hassan ,Associate professor of poultry physiology, poultry production Department , Faculty of Agriculture , Ain shams University , for his guidance, great help and many valuable suggestions during the whole period of experimental work Many thanks and gratitude are also extended to Dr. Faisal Bayoumy Abd El-Salam , Lecture of poultry physiology, poultry production Department Faculty of Agriculture , Ain shams University , for his supervision and the great facilities he offered to me for thecondition of the practical part of my thesis.

My special thanks are due to Department of Avian Production, Ain Shams University, Faculty of Agriculture Farm for the facilities they offered during the practical part of this study and to workers and colleagues who assisted.

Finally, my acknowledgement are extend to my whole family, parents, sisters and brothers for their unlimited support , encouragement and caring not only during this graduate study but also in my whole life.

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I- INTRODUCTION

Zinc is one of the trace elements necessary for the healthy development and functioning of living organisms. However, in tissue, its concentrations are not high. It is stated that the adult human body contains only 2–3 grams of zinc, with 90% of it deposited in muscle tissue and bones. The other 10% can be found in the prostate, liver، digestive tract, kidneys, skin, lungs, brain, heart and pancreas (**Lichten and Cousins, 2009**). On the cellular level, 30–40% of the zinc is located in the nucleus, 50% in cytosol، and the rest in the membrane. Zinc is necessary for the proper functioning of many enzymatic systems, and the insulin system is probably the most important one. It also plays a significant role in various peptidases, esterases and dehydrogenases. It influences the immune system, DNA synthesis, cell proliferation، protein synthesis and the incorporation of iron into the haemoglobin.

The European Commission issued Regulation No. 1334/2003, which limits the maximum tolerable zinc levels in feed mixtures for livestock at 150 mg/kg, and in animal breeding at 250 mg/kg. Many authors have demonstrated the impact of zinc supplementation within several indices of the internal environment in birds (**Sahin *et al.,* 2005) and in Humans, (Hughes and Samman, 2006**).

Another important trace element is the copper. Copper sulfate (CuSO4) has been recognized as a feed additive for rabbits to improve growth rate and reduce entric diseases. Several studies had been conducted to evaluate CuSO4 as found by **Bassuny (1991)** who reported an improvement of daily gain, feed intake and feed conversion ratio for the copper supplement in NZW rabbits.

Also, the addition of 100 ppm copper (as Cuo form) to the basal ration improved growth performance in the growing rabbit's without

accumulative effect of Cu on liver tissues **Bassuny (1991)** Adding of rabbits diet with copper could improve growth performance and reproductive efficiency for NZW rabbits (**Maria *et al.*, 2000; Moce *et al.*, 2000 and Attia, 2003**).

Thus, the aim of this study is to indicate that these trace elements cu and zn sulphate could improve the physiological and reproductive performance of rabbits does. Therefore, the objective of the present study was performed to investigate some productive performance traits and some blood parameters of NZW rabbits does as influenced by different levels of dietary copper and zinc sulphate supplementation.

II- REVIEW OF LITERATURE

1- Rabbit production:

Several reports (**FAO, 1987**) showed that rabbit raising may contribute in solving protein deficiency problem in developing countries like Egypt. This basic understanding is largely attributable to the rabbits high rate of reproduction and early maturity, rapid growth rate, high genetic selection potential, efficient feed and land space utilization, limited competition with humans for similar foods and high quality nutritious meat, as documented by **Cheeke (1980). Lukefahr (1985)** estimated the world's domestic rabbit population to be 709 million, which is most comparable to 764 million swine (**FAO, 1982**) At least 82 percent of the world's production of rabbit meat occurs in the developed nations (**Lebas *et al*., 1984)** Less than 18 percent of total rabbit meat production, there fore, is represented in developing countries. In the classic review, paper by **Owen (1981)** it was emphasized that in developing countries, where critical national meat shortages exist; the potential for rabbit production is greatest. A discrepancy is strongly apparent, therefore, between world geographical distribution of rabbits and nations in great need of inexpensively produced rabbit meat.

Thermoregulation :

For all mammalian species, there is a limited range of physical conditions within which they can survive and reproduce. Conditions outside this range will either kill them, or reduce or prevent their production and reproduction. Consequently, extremes in unfavourable weather (i.e. ambient temperature) can show drastic effects upon the size of animal populations. Besides these harmful effects of extremrs in conditions, virtually all animals activities were dependent upon the