

# EFFECT OF USING L-TYROSINE ON SOME PHYSIOLOGICAL AND PRODUCTIVE CHARACTERISTICS IN FEMALE WHITE NEW ZEALAND RABBITS

## BY MOHAMED LOUTFI AHMED MOHAMED

B.Sc. Agricultural science (Poultry production), Fac. Agric., Zagazig Univ. (2003) M.Sc. Agricultural science (Poultry production), Fac. Agric., Zagazig Univ. (2009)

Thesis submitted in partial fulfillment of

the requirements for the degree of

Doctor of Philosophy in Agricultural Science

(Poultry Production)

Animal Production Department

Faculty of Agriculture

Suez Canal University

2018

#### CONTENTS

P

J	Pag
3.6.2.3. Average kit weight	40
3.6.2.4. Total mortality rate	40
3.6.3. Blood parameter	41
3.6.3.1. Hormonal profile	41
3.6.3.2. Blood biochemical profile	42
3.7. Statistical analysis	42
4. RESULTS AND DISCUSSION	43
4.1. Does parameters	43
4.1.1. Live body weight of does at different periods	43
4.1.2. The reproductive traits	46
4.1.3. Gestation period, kindling interval and number of	
parities	52
4.1.4. Weekly milk yield	55
4.1.5. Total mortality rate of does	59
4.1.6. Economic efficiency	61
4.2. Offspring parameters.	63
4.2.1. Total litter size and total mortality rates	63
4.2.1.1. Average kit weight and total litter weight	68
4.3. Blood parameters	74
4.3.1. Hormonal profile	74
4.3.1.1. Estradiol hormone levels	74
4.3.1.2. Progesterone hormone levels	77
4.3.1.3. Triiodothyronine hormone levels	80
4.3.2. Blood biochemical profile	81
4.3.2.1. Total Protein	81
4.3.2.2. Total Lipids	82
4.3.2.3. Albumin	85
4.3.2.4. Globulin	85
4.3.2.5. Albumin /Globulin ratio	86
4.4. Correlation coefficients between L-tyrosine treatment,	
some productive and reproductive traits	88
5. SUMMARY AND CONCLUSION	97
6. REFERENCES	103
ARABIC SUMMARY	

#### LIST OF TABLES

No.		Page
1	Experimental design	33
2	The ingredients and chemical composition of the pelleted ration fed to rabbits, during the experimental period	37
3	Live body weight of does (g) at different ages and status of does as affected by administration of L-tyrosine (Mean $\pm$ S.E)	44
4	Effect of L-tyrosine treatments on vulva coloration, receptivity rate, female receptivity time and conception rate of doe (Mean $\pm$ S.E)	50
5	Effect of L-tyrosine treatments on gestation period, kindling interval and numbers of parities (Mean $\pm$ S.E)	54
6	Effect of L-tyrosine treatments on average weekly milk yield at first, second, third, fourth week of suckling and total milk yield (g/day/doe, Means $\pm$ S.E)	57
7	Effect of L-tyrosine treatments on total mortality (%) and economic efficiency of the does	60
8	Effect of L-tyrosine treatments on average total litter size and total mortality rate at birth and at weaning (Mean $\pm$ S.E)	66
9	Effect of L-tyrosine treatments on average kit weight and total litter weight (g) at birth and at weaning (Mean $\pm$ S.E)	72
10	Effect of L-tyrosine treatments on serum levels of estradiol $(E_2)$ , progesterone $(P_4)$ and total triiodothyronine $(T_3)$ hormones at five, at ten months of age and overall mean in NZW does (Mean $\pm$ S.E)	81
11	Effect of L-tyrosine treatments on serum levels of total protein (g/dl) and total lipids (mg/dl) at 5 and at 10 months of	
	age in NZW does (Mean ± S.E)	84

No.		Page
12	Effect of L-tyrosine treatments on serum levels of albumin	
	(g/dl), globulin (g/dl) and albumin/globulin (A/G) ratio at five	
	and at ten months of age in NZW does (Mean $\pm$ S.E)	87
13	Correlation coefficients between single dose of L-tyrosine,	
	some productive and reproductive traits in NZW rabbit	
	females	92

### LIST OF FIGURES

No.		Page
1	Percent change in average live body weight at 5 months of age as affected by L-tyrosine treatments in NZW does compared to control group	45
2	Percent change in average live body weights at mating as affected by L-tyrosine treatments in NZW does compared to control group during the whole experimental period	45
3	Percent change in average live body weight after every parturition as affected by L-tyrosine treatments in NZW does compared to control group	46
4	Percent change in receptivity time during mating of the rabbit doe as affected by L-tyrosine treatments of NZW does compared to control group during the whole experimental period	51
5	Percent change in receptivity rate as affected by L-tyrosine treatments compared to control group during the whole experimental period	51
6	Percent change in conception rate as affected by L-tyrosine treatments of NZW does compare to control group	52
7	Percent change in kindling interval as affected by L-tyrosine treatments on of NZW does compared to control group during the whole experimental period	55
8	Percent change in numbers of parities as affected by L-tyrosine treatments of NZW does compared to control group	55
9	Percent change in the average weekly milk yield as affected by L-tyrosine treatments in NZW does compared to control group	58
10	Percent change in the total mortality rate of does as affected by L-tyrosine treatments in NZW does compared to control group.	61

11	Percent change in economic efficiency as affected by L- tyrosine treatments of NZW does compared to control group	63
12	Percent change in total litter size at birth as affected by L- tyrosine in NZW does compared to control group	67
13	Percent change in total litter size at weaning as affected by L- tyrosine treatments of NZW does compared to control group	67
14	Percent change in total mortality rate at weaning as affected by L-tyrosine treatments in NZW does compared to control group	60
15	Percent change in average kit weight as affected by L-tyrosine treatments at weaning in NZW does compared to control group	68 73
16	Percent change in total litter weights at birth as affected by L- tyrosine treatments in NZW does compared to the untreated does	73
17	Percent change in total litter weights at weaning as affected by L-tyrosine treatments of NZW does compared to control group.	74
18	Percent change in serum estradiol level at 5 months of age as affected by L-tyrosine treatments in NZW does compared to control group	76
19	Percent change in serum estradiol level at 10 months of age as affected by L-tyrosine treatments in NZW does compared to control group	77
20	Percent change in overall progesterone level at 5 months as affected by L-tyrosine treatments in NZW does compared to control group	79
	<i>0</i>	19

No.		Page
21	Percent change in overall progesterone level at 10 months of age as affected by L-tyrosine treatments in NZW does compared to control group	79
22	Correlation between receptivity (%) and economic efficiency (%) of NZW doe	93
23	Correlation between conception rate and number of parities of NZW doe	93
24	Correlation between conception rate and receptivity time (sec) of NZW doe	94
25	Correlation between conception rate and kindling interval of NZW doe	94
26	Correlation between economic efficiency (%) and number of parities of NZW doe	95
27	Correlation between litter weight at birth (g) and total litter weight at weaning (g) of NZW doe	95
28	Correlation between economic efficiency (%) and total litter weight at weaning (g) of NZW doe	96
29	Correlation between total litter size at weaning and average kit weight at weaning (g) of NZW doe	96

Author:	Mohamed Loutfi Ahmed Mohamed
Title:	Effect of using L-tyrosine on some physiological and productive characteristics in female White New Zealand
	rabbits
Faculty:	Agriculture – Suez Canal University
Department:	Animal Production
Location:	Ismailia – Egypt
Degree:	Doctor Of Philosophy In Agriculture Science
Date:	03/07/2018
Language:	English

#### ABSTRACT

This study was carried out to investigate the effect of using oral dose of Ltyrosine on some productive and reproductive performance of female New Zealand White (NZW) rabbits and growth performance of the offspring as well. Sixty five immature females (two months old) were randomly distributed into five equal groups according to interval doses of L-tyrosine (100 mg/kg BW). The  $1^{st}$  group (control) was served as a control (no treatment), while the  $2^{nd}$ group (TR1) was given a single dose of L-tyrosine at two months of age, the 3<sup>rd</sup> (TR2) was given two doses at 2 and at 4 months of age, the 4<sup>th</sup> group (TR3) was given three doses at 2, 4 and at 6 months of age and the last group (TR4) group was given four doses at 2, 4, 6, and at 8 months of age. Treatment was administrated orally after dissolving L-tyrosine dose in water. The results revealed that the administration of L-tyrosine at 2 months of age with single dose (100 mg/kg LBW) improved significantly sexual receptivity rate, doe receptivity time (sec), the conception rate, kindling intervals (days), milk yield, economic efficiency, average of total litter size and their weights at birth and at weaning. Also increased levels of progesterone and estradiol hormones in treated does compared with control. A single oral dose of L-tyrosine (100 mg/kg LBW) at two months of age maximized the productive and reproductive performance of NZW rabbits under commercial production condition.

#### ACKNOWLEDGEMENT

First of all and foremost, I would like to thank **Allah**, the almighty (all praises to **Allah**) for enabling me to conduct this study.

My great personal indebtedness and gratefulness to **Prof. Dr. Mostafa Abdel-Sattar Ayoub**, Professor of Animal Physiology, Animal Production Department, Faculty of Agriculture, Suez Canal University for suggesting the study plan of this thesis and keeping track of all steps and for his continuous encouragement.

I wish to express my sincere appreciation and personal gratitude to **Prof. Dr. Hassan Abdel-Ghafar Khalil,** Professor of Poultry Physiology, Animal Production Department, Faculty of Agriculture, Suez Canal University, for his dear services during the time of the study and dear thanks for keeping track of the thesis stage, encouragement and his permanent advice.

Also I wish to express my sincere appreciation and gratefulness to **Prof. Dr. Ibrahim Mohamed Assaf** Professor of Poultry Nutrition, Poultry Nutrition Department, Animal Production Research Institute, for his close support during the study and dear thanks for keeping track of the thesis, encouragement and his permanent advice. I wish to extend thanks to all staff members and graduate students of the Animal Production Department and Animal Production Research Institute for their help and co-operation.

Finally, I am greatly indebted to my father, mother, my wife, my daughters, my brothers, my sister and my friends for their continuous support and kind encouragement for me to complete this work.