



*Benha University
Faculty of Vet. Medicine
Dept. of pharmacology*

Pharmacological Study on GABA in Poultry with Special Reference to Its Effect on Performance

*Thesis Presented
by*

Yasmeen Ahmed Mohamed Shahine

**B.V.Sc, Faculty of Veterinary medicine Kafr El-Sheikh University (2011)
M.V.Sc., Faculty of Veterinary medicine Kafr El-Sheikh University (2016)**

**For Fulfillment of PhD in
Veterinary Medical Science
(Pharmacology)
Under supervision of**

Prof. Dr.

Ashraf Abd-Elhakim El-komy

**Professor and Head of pharmacology Department
Faculty of Veterinary Medicine
Benha University**

Prof. Dr.

Abou El-nasr Ahmed zahra

**Professor and Head of pharmacology Department
Faculty of Veterinary Medicine
Kafr El-Sheikh University**

Dr.

Mohamed Hafez Abou Bakr

**Assistant. Prof. of Pharmacology
Faculty of Veterinary Medicine
Benha University**

Prof. Dr.

Soad Saad Belih

**Head Research of Clinical Pathology
Animal Health Research Institute
Tanta Lab**

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LIST OF CONTENTS

Contents	pages
1-Introduction.....	1
2-Review of Literature	4
3- Materials and Methods	31
3.1. Materials.....	31-34
3.1.1. Laying hens.....	
3.1.2. Drug.....	
3.1.3. Experimental diet.....	
3.1.4. Materials used for eggs measurements.....	
3.1.5. Materials used for hematological studies.....	
3.1.6. Materials used for clinicobiochemical studies.....	
3.1.7. Materials used for estimation of Lipid peroxidation and antioxidant enzymes.....	
3.1.8. Materials used for histopathology.....	
3.2.Methods	35
3.2.1. Experimental design.....	
3.2.2 Sampling.....	
3.2.3. Performance parameters estimation.....	

3.2.4. Egg quality measurements.....	
3.2.5. Determination of hematological parameters.....	
3.2.6. Serum biochemical parameters.....	37-47
3.2.7. Oxidant and antioxidant parameters.....	
3.2.8. Histopathological examination.....	
4.Results	
4.1. Productive Performance.....	
4.2. Feed Conversion Ratio	
4.3. External Egg Quality.....	
4.4. Internal egg quality.....	
4.5. Egg cholesterol and triglycerides.....	48-84
4.6. Blood Picture.....	
4.7. Differential Leukocytic counts	
4.8. Blood serum units.....	
4.9.Histopathological results.....	
5.Discussion.....	85
6-Summary	95
7-Conclusions and recommendations.....	98
8-References.....	100
9-Arabic Summary.....	-

LIST of TABLES

<i>Table</i>	<i>Page number.</i>
Physical and chemical composition of the laying hen diets.	32
Experimental design.	35
Effect of GABA on egg production % of laying hens.	48
Effect of GABA on egg weight (gm/egg) of laying hens.	49
Effect of GABA on egg mass (gm/day/hen) of laying hens.	50
Effect of GABA on feed conversion ratio (FCR) of laying hens.	51
Effect of GABA on egg shape index of laying hens.	52
Effect of GABA on shell weight of laying hens.	53
Effect of GABA on shell thick of laying hens.	54
Effect of GABA on egg yolk quality of laying hens.	55
Effect of GABA on albumen quality of laying hens.	57
Effect of GABA on egg cholesterol contents of laying hens.	59

List of Figures

<i>Figures</i>	<i>Page no.</i>
Chemical structure of GABA.	31
Effect of GABA on average egg production% throughout the experimental period of laying hens.	48
Effect of GABA on average egg weight throughout the experimental period of laying hens.	49
Effect of GABA on average egg mass throughout the experimental period of laying hens.	50
Effect of GABA on average FCR values throughout the experimental period of laying hens.	51
Effect of GABA on average egg index values throughout the experimental period of laying hens.	52
Effect of GABA on average shell weight values throughout the experimental period of laying hens.	53
Effect of GABA on average shell thick values throughout the experimental period of laying hens.	54
Effect of GABA on yolk weight values throughout the experimental period of laying hens.	56
Effect of GABA on yolk index % values throughout the experimental period of laying hens.	56
Effect of GABA on yolk colour values throughout the experimental period of laying hens.	56
Effect of GABA on albumin weight values throughout the experimental period of laying hens.	58
Effect of GABA on albumen % values throughout the experimental period of laying hens.	58
Effect of GABA on average Haugh unit values throughout the experimental period of laying hens.	58
Effect of GABA on egg cholesterol throughout the experimental period of laying hens.	59
Effect of GABA on egg triglycerides throughout the experimental period of laying hens.	60
Effect of GABA on RBCS throughout the experimental period of laying hens.	61

List of Figures

Effect of GABA on WBCS count $\times 10^3$ throughout the experimental period of laying hens.	62
Effect of GABA on Hb% throughout the experimental period of laying hens.	62
Effect of on PCV% throughout the experimental period of laying hens.	62
Effect of on Heterophil throughout the experimental period of laying hens.	63
Effect of on Basophil% throughout the experimental period of laying hens.	64
Effect of on eosinophil % throughout the experimental period of laying hens.	64
Effect of on lymphocyte% throughout the experimental period of laying hens.	65
Effect of on monocyte % throughout the experimental period of laying hens.	65
Effect of on triglycerides (mg/dl) throughout the experimental period of laying hens.	66
Effect of on total cholestrol (mg/dl) throughout the experimental period of laying hens.	67
Effect of on HDL (mg/dl) throughout the experimental period of laying hens.	67
Effect of on LDL (mg/dl) throughout the experimental period of laying hens.	67
Effect of on VLDL (mg/dl) throughout the experimental period of laying hens.	68
Effect of on CHO/HDL ratio throughout the experimental period of laying hens.	68
Effect of on MDA (Mmol/l) throughout the experimental period of laying hens.	69
Effect of on CAT (u/ml) throughout the experimental period of laying hens.	70
Effect of on SOD (u/ml) throughout the experimental period of laying hens.	70
Effect of on GSH-PX micro (mol/l) throughout the experimental period of laying hens.	70
Effect of on cortisol (ng/ml) throughout the experimental period of laying hens.	71
Effect of on Epinephrine (pg/ml) throughout the experimental period of laying hens.	72

List of Figures

Effect of on norepinephrine(pg/ml) throughout the experimental period of laying hens.	72
Effect of GABA on haptoglobin ($\mu\text{g/ml}$) throughout the experimental period of laying hens.	73
Effect of GABA on IGG (μ /ml) throughout the experimental period of laying hens.	73
Figure (40) showing normal liver of control group showing normal portal area and normal hepatocytes. (H&Ex200).	74
Figure (41) showing normal liver of control group showing normal portal area, and normal hepatocytes. (H&Ex400).	74
Figure (42) showing normal spleen with red pulp infiltrated with monocytes(H&EX400)	75
Figure (43) showing Kidney of control group showing normal bowman's capsule and normal normal renal tubules.(H&E x200).	75
Figure (44) showing Kidney of control group showing normal bowman's capsule and normal renal tubules. (H&E x200).	76
Figure (45) showing Intestine with normal intestinal layers, normal villi and intestinal crypts. (H&Ex200).	76
Figure (46):spleen of poultry of group (2) which treated with GABA at dose 5mg/kg showing widely dilated splenic sinusoids in the splenic parenchyma.(H&EX400).	77
Figure (47):spleen of poultry of group (2) showing mild depletion of lymphoid cells in the red pulp of spleen.(H&EX400).	77
Figure (48): liver of poultry of group (2) revealing widely dilated hepatic sinusoid.(H&EX400).	78
Figure (49): liver of poultry of group (2) revealing widely dilated hepatic sinusoid.(H&EX400).	78
Figure (50): kidney of poultry of group (2) showing hypercellularity of the glomerular to fill bowmans space.(H&EX400).	79

List of Figures

Figure (51):kidney of poultry of group(2)illustrating necrobiotic changes of tubular epithelium(H xEX400).	79
Figure (52): intestine of poultry of group (2) illustrating vaculation of the surface enterocytes of the intestinal villi. (H&EX400).	80
Figure(53):intestine of poultry of group (2)showing intestinal crypts denoting proliferation of the cells.(H&EX400).	80
Figure (54): spleen of poultry of group (3) which treated with GABA at dose (10mg/kg).(H&EX200).	81
Figure (55):liver of poultry of group (3) demonstrating focal mononuclear cell infiltration .(H&EX400).	81
Figure (56): Liver of poultry of group (3): showing distortion of the hepatic cords.(H&EX400).	82
Figure (57): kidney of poultry of group (3)showing necrobiotic changes of the tubular epithelium .(H&Ex200).	82
Figure (58): kidney of poultry of group (3) showing necrobiotic changes of tubular epithelium .(H&EX400).	83
Figure (59): intestine of poultry of group (3) lamina propria of intestinal mucosa revealing proliferation of the cells (H&EX400).	83
Figure (60): intestine of poultry of group (3) showing vaculation of the cells theintestinal crypts proliferation of the cells lining the intestinal crypts is evident.(H&EX400).	84

6. Summary

The main objectives of this study was to find out the impacts of the (GABA) Gamma Amino Butyric Acid on layers, by measuring its effects on egg production performance parameters internal and external egg quality parametrs. The role of “GABA” on hematological and immunological parameters . Effects of “GABA” on antioxidant parameters were performed through evaluating malondialdhyde (MDA), glutathione peroxidase (GSH-Px), superoxide dismutase (SOD) and catalase enzyme. Histopathological examinations reflected the affection of liver , kidney ,spleen and intestine by ”GABA”.

Our experiment was conducted for four weeks on 60 lohman hens (32 weeks age)divided to 3 equal groups as the following:

- **Group (1):** It was act as control group (not treated).
- **Group (2):** It was given the GABA at a dose of 40 mg/kg of body weight for four weeks in drinking water.
- **Group (3):** It was given the GABA at a dose of 80mg/kg of body weight for four weeks in drinking water.

Eggs of laying hens of the 3 groups were collected daily along the entire period of the experiment for estimation of egg production, egg weight, egg mass and external egg parameters (Eggshell breaking strength and eggshell thickness) &internal egg parameters (Haugh units, albumen height, and yolk colour).

2 blood samples from wing vien of 5 hens in each group were collected at the end of experiment. First sample was taken on K3 EDTA tubes for estimation of hematological parameters. Second sample was taken on plain tube without anticoagulant for estimation of serum biochemical parameters. Also we take samples from livers of five hens in each group for estimation of antioxidant

parameters. Finally samples from liver, kidney, intestine and spleen were taken on 10% formaline for histopathological examination.

It has been observed that GABA produced no significant increase in eggs production % and egg weight of laying hens in treated groups when compared to control in 1st week. But in 2nd, 3rd and 4th weeks there was a significant increase in group 3 when compared with the control.

It has been observed that GABA produced a significant increase in egg mass of laying hens in treated groups when compared to control in 1st and 2nd weeks.

It has been observed that there was significant increase in feed conversion of laying hens in treated groups when compared to control in the 3rd week.

Also GABA has been realized that there was a significant increase in egg shape index (ESI) in the 3rd and 4th weeks in group 3 when compared to group 2. As well as there were significant increase in group 3 when compared to control in 2nd, 3rd and 4th weeks in egg shell quality (egg shell weight and shell thick).

In relation to effect of GABA on internal egg quality either egg yolk quality (yolk weight, index and yolk color) or albumen quality (albumen weight, albumen % and color) of laying hens, there was a significant increase in group 3 (80mg/kg) when compared to control in 2nd, 3rd and 4th weeks of the experiment .

It was confirmed that GABA has a significant effects on egg cholesterol and triglycerides in treated groups when compared to control. From the 1st, 2nd, 3rd till 4th weeks as it decrease cholesterol and triglycerides.

While in hematological parameters, It has been observed that there were a significant increase in RBCS, WBCS, Hb mg/dl and pcv% of laying hens in

group2 when compared to control. While in group 3 there were a significant increases in RBCS and PCV% when compared to control.

Also it has been observed that there were a significant increase in lymphocyte % of laying hens in group2 when compared to control.

Concering to blood serum lipids profile it has been observed that there were a significant decrease in Total cholesterol and LDL of laying hens in treated groups (40mg/kg, 80mg/kg) when compared to control, but there were a significant increase in HDL in treated groups when compared to control.

Regarding to antioxidant enzyme activities, It has been observed that there were no significant increase in CAT, SOD and GSH-Px of laying hens in treated groups when compared to control. Also there were no significant increase between treated group.As for GABA effect on MDA, there were no significant decrease in treated groups when compared to control.

Regarding to the effect of GABA it has been observed that there were a significant decrease in cortisol and norepinephrine of laying hens in treated groups when compared to control. While there were no significant decrease in epinephrine and haptaglobulin between treated groups. But there were a significant increase in IGG in treated groups when compared to control.

Finally , histopathological investigations revealed that the group 3 which treated by a dose of 80mg/kg of body weight reavling that proliferation of cells of lamina proprai. and intestinal crypts led to increase length and depth of intestinal villi which led to increase surface area of absorbtion which confirmed increase absorption of calcium and phosphorus resulted in increase production of eggs and eggs quality which improved the production performance and eggs quality.