APPROVAL SHEET

STUDY OF SOME NUTRITIONAL FACTORS WHICH CAUSE UROLITHIASIS IN PULLETS

BY

KARAM MOHMOUD ABD-EL-HAMID MAHMOUD

B. Sc. Agric. Sci. (Poulty production), Ain Shams Univ., 1992

657.5
K.M

62005

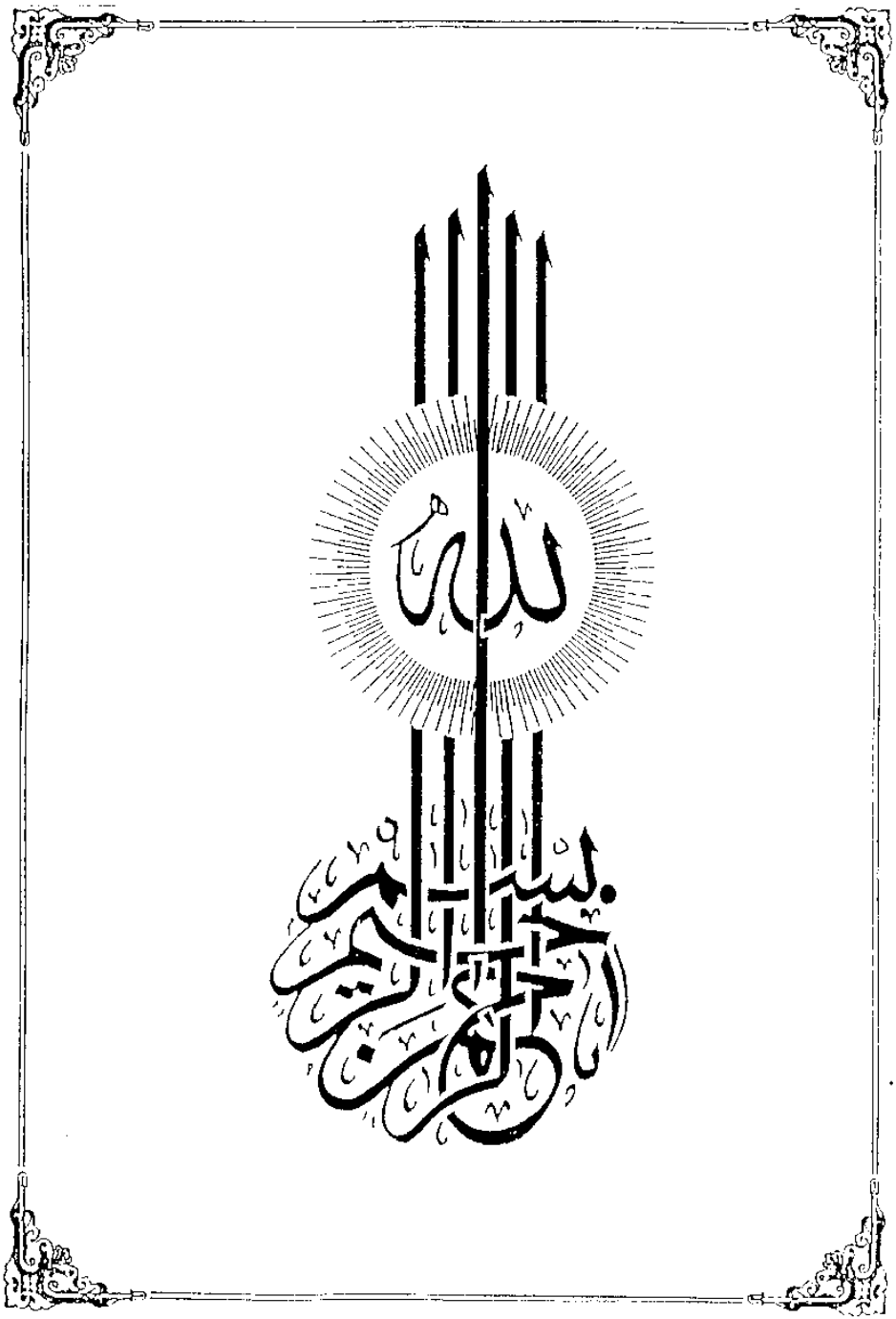
This thesis for M.Sc. degree has been approved by:

1- Prof. Dr. Fouad M. Atia.....
Prof. of Poultry Nutrition, El-Azhar University

2- Prof. Dr. Maie F. M. Ali.....
Prof. of Poultry Phsiology, Ain-Shams University

3- Prof. Dr. Hussein A. El-Alaily.....
Prof. of Poultry Nutrition, Ain-Shams University

Date of examination: / /1997



Central Library - Ain Shams University

STUDY OF SOME NUTRITIONAL FACTORS WHICH CAUSE UROLITHIASIS IN PULLETS

BY

KARAM MAHMOUD ABD EL-HAMID MAHMOUD

B. Sc. Agric. Sci. (Poulty Production), Ain Shams Univ., 1992

6200 5

637.5
K M

Thesis submitted in partial fulfillment
of
the requirment for the degree of

MASTER OF SCIENCE

in

Agriculture Science
(Poultry Nutrition)

فهرسة المعلومات الجامعية
قسم تصوير ميكرو فيلميا
توثيق الميكروفيلم
1

Department of Poultry Production
Faculty of Agriculure,
Ain Shams University

1997

Central Library - Ain Shams University

Central Library - Ain Shams University

STUDY OF SOME NUTRITIONAL FACTORS WHICH CAUSE UROLITHIASIS IN PULLETS

BY

KARAM MAHMOUD ABD EL-HAMID MAHMOUD

B. Sc. Agric. Sci. (Poulty Production), Ain Shams Univ., 1992

Under the supervision of:

Dr. Hussein .A. El-Alaily
Prof. of Poultry Nutrition,
Department of Poultry Production,
Faculty of Agriculture,
Ain Shams Univ.

Dr. Alaa El-Din A. Hemid
Assistant Professor of Poultry Nutrition,
Department of Poultry Production,
Faculty of Agriculture,
Ain Shams Univ.

Central Library - Ain Shams University

Central Library - Ain Shams University

ABSTRACT

Karam Mahmoud Abd-El-Hamid Mahmoud. Study of some nutritional factors which cause urolithiasis in pullets. Unpublished Master of Nutrition, Dept. of Poultry Production, Fac. of Agric., Univ. of Ain Shams, Cairo, Egypt, 1997.

The main objectives of this thesis were to study the effect of some nutritional factors on the kidneys function and performance of Hy-Line W36 White layers. Three hundred twenty four-day old Hy-Line W36 White chickens were used to examine the response of feed intake, laying performance, some blood constituents and kidney function to six different experimental treatments (control, high calcium (3.5), 1.25, 2.5, 5% urea and meat meal diets. Fifty four chickens were assigned at random to each treatment in three replicates each contain 18 chickens.

The results indicated that: 1- Body weight, body weight gain, feed intake, efficiency of feed utilization, egg number, egg production, egg mass and average egg weight were decreased significantly for birds fed the high calcium, 1.25%, 2.5% and 5% urea diets.

2- The blood analysis showed that

* Serum uric acid levels were significantly increased in layers fed the high calcium, urea and meat meal diets.
* Serum urea levels were significantly increased gradually as urea content increased in the diets.
* Serum creatinine levels were significantly higher in layers fed on the high calcium, urea and meat meal diets than in layers fed on the control diet.

Central Library - Ain Shams University

* Serum calcium levels were increased significantly until 12 weeks of age for birds fed the high calcium diet.

* Serum phosphorus level was significantly decreased through the rearing period for birds fed the high calcium diet.

* Serum magnesium was in-significantly differents for birds fed the sex experimental diets compared with control.

3- Severity cases from urolithiasis and kidney degeneration were observed in birds fed the high calcium diet. Typical incidence of urolithiasis was observed for layers fed the 1.25%, 2.5%, 5% urea and meat meal diets.

It was concluded that increasing the intake of nitrogen in the form of urea and calcium in order to increase production may in fact have the opposite effect. Leading to degenerative changes in various tissues and leading to nephritis.

Key words: Urolithiasis, gout, chickens, pullets, high calcium, urea, meat meal and layer performance.

Central Library - Ain Shams University

ACKNOWLEDGMENT

First of all, endless thanks to Allah who has given me every thing I have and I owe him everything I achieved.

I wish to express my deep appreciation and gratitude to Prof. Dr. H.A. El-Alalily, Professor of Poultry Nutrition, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, for his close supervision, encouragement, financial assistance and helpful guidance which he gave during the course of this study and preparation of the manuscript.

I am very grateful to Dr. Alaa-Eldin A. Hemid, Associate Professor of Poultry Nutrition, Department of Poultry Production, Faculty of Agriculture, Ain Shams University for his supervision, patience, encouragement, invaluable advice and his effort in revising the thesis.

I am grateful to Prof. Dr. A.A. Samy, Professor of Poultry Disease, Department of Poultry Disease, Faculty of Veterinary Medicine, Alexandria University, who has continually provided his utmost support and ideal guidance.

My utmost gratitude and deep thanks are due to Prof. Dr. Aly A. Hegazy, Professor of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University, for all effort he has made throughout this work, without his instructive criticism and valuable advice I would not have completed this work.

All true words of acknowledgment and thanks are not enough to express my feelings of appreciation towards Misr Hatchery Co. for providing the facilities without this work wouldn't have been done.

Central Library - Ain Shams University

Many thanks, for the Co-operation, of all staff members in Ain Shams colleague and workers in Department of Poultry Production.

Central Library - Ain Shams University

CONTENTS

	Page
I. INTRODUCTION	**1**
II. REVIEW OF LITERATURE	**2**
2.1. What is urolithiasis	**2**
2.2. The causes of uroiothasis	**5**
2.2.1. Nutritional factors	**5**
2.2.1.1. Excess calcium	**5**
2.2.1.2. Urea	**7**
2.2.1.3. Excess protein	**8**
2.2.1.4. Vitamin A deficiency	**11**
2.2.1.5. Water deprivation	**12**
2.2.1.5.1. Quality of drinking water	**12**
2.2.1.5.2. Quantity of drinking water	**13**
2.3. Toxins	**16**
2.4. Other dietary factors	**17**
2.5. Infectious disease	**18**
2.6. Chemical Pathology of Urolithiasis	**20**
2.7. Effect of urolithiasis on hens performance	**21**
2.8. Redused avian kidney damage and urolithiasis induced.	**24**
III. MATERIALS AND METHODS	**27**
3. Experimental setting	**27**
3.1. Design	**27**
3.1.2. Birds	**28**
3.1.3. Diets	**28**
3.2. Experimental conditions	**34**
3.2. Housing	**34**
3.1.2. Feeding and drinking	**34**
3.2.2. Lighting program	**34**

Central Library - Ain Shams University

	Page
3.2.3. Traits	35
3.3. Measured traits	35
3.4. Pathological and blood analysis	35
3.5. Calculation traits	36
3.6. Statistical analysis	37
3.7. Method of vaccine application	38
IV. RESUTS AND DISCUSSION	35
4.1. Effect of the experimental diets on pullets performance (1-18 wk)	39
4.1.1. Body weight.	39
4.1.2. Body weight gain	39
4.1.3. Feed intake	43
4.1.4. Efficiency of feed utilization	45
4.2. Effect of the experimental diets on layers performance (19-40 wk)	46
4.2.1. Body weight.	46
4.2.2. Body weight gain	48
4.2.3. Feed intake	48
4.2.4. Efficiency of feed utilization	50
4.2.5. Total egg mass	50
4.2.6. Egg production	53
4.2.7. Average egg weight	53
4.2.8. Mortality rate	57
4.3. Effect of dietary treatments on some serum constituents	57
4.3.1. Uric acid levels.	57
4.3.2. Urea levels.	64
4.3.3. Creatinine levels.	67
4.3.4. Calcium levels.	67
4.3.5. Phosphorus levels.	75
4.3.6. Magnesium levels.	75
4.4. Histopathological examination.	75

Central Library - Ain Shams University

	Page
4.4.1. Birds on calcium diet.	78
4.4.2. Birds on urca diets.	80
4.4.3. Birds on meat meal diet.	80
V. **SUMMARY**	91
V.I. **REFERECES**	96
V.I.I. **APPENDIX**	110
V.I.I.I. ARABIC SUMMARY	

Central Library - Ain Shams University

Central Library - Ain Shams University