



# **EFFECTS OF USING ONION AND GARLIC AS A GROWTH PROMOTER IN BROILER CHICKEN**

**MOHAMMAD ABDUL MOYED SHARIF**

Roll No.: 0116/01

Registration No.: 284

Session: 2016-2017 (January-June)

**A thesis submitted in the partial fulfillment of the requirements for the degree of  
Master of Science in Animal and Poultry Nutrition**

**Department of Animal Science and Nutrition**

**Faculty of Veterinary Medicine**

**Chittagong Veterinary and Animal Sciences University**

**Chittagong-4225, Bangladesh**

**December 2017**

### **Authorization**

I hereby declare that I am the sole author of the thesis. I also authorize the Chittagong Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize the CVASU to duplicate the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I, the undersigned, and author of this work, declare that the **electronic copy** of this thesis provided to the CVASU library, is an accurate copy of the print thesis submitted, within the limits of the technology available.

**The Author**  
December, 2017

# **EFFECTS OF USING ONION AND GARLIC AS A GROWTH PROMOTER IN BROILER CHICKEN**

**MOHAMMAD ABDUL MOYED SHARIF**

Roll No.: 0116/01

Registration No.: 284

Session: 2016-2017 (January-June)

**This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made**

---

**(Dr. Hasanuzzaman)**

Professor  
Department of Animal Science and Nutrition  
**Supervisor**

---

**(Dr.Md. Manirul Islam)**

Professor  
Department of Animal Science and Nutrition  
**Chairman of the Examination Committee**

**Department of Animal Science and Nutrition**

**Faculty of Veterinary Medicine**

**Chittagong Veterinary and Animal Sciences University (CVASU)**

**Chittagong-4225, Bangladesh**

**December 2017**

## **Acknowledgements**

Firstly, the author would like to convey his deepest sense of gratitude to “The Almighty” who makes His enable to complete the research work and exposition successfully.

Secondly, the author would like to articulate his foremost heartiest appreciation, deepest sense of gratitude and best regards to the supervisor, **Dr. Hasanuzzaman**, Professor, Department of Animal Science and Nutrition, Chittagong Veterinary and Animal Sciences University (CVASU). The author really deems proud to do research work under his constructive, useful and effective supervision.

The author feel much pleasure to express the profound gratitude to **DR. Mahabub Alam**, Assistant Professor, Department of Animal Science and Nutrition, CVASU for his help regarding statistical analysis, valuable advice and scholastic guidance.

The author also takes privilege to acknowledge **Dr. Md. Manirul Islam**, Professor and Head, Department of Animal Science and Nutrition, CVASU for his support to overcome any emergency.

The author acknowledges to all lab technicians and supporting staffs, Department of Animal Science and Nutrition, CVASU for their helps during research work in the shed and Animal Nutrition Laboratory, CVASU.

The author is indebted and grateful to his beloved parents and all family members for their immense sacrifice, blessings, and encouragement throughout the entire period of studious life.

**The Author**  
December, 2017

## Table of contents

<b>Topics No.</b>	<b>Page</b>
<b>Authorization</b>	<b>ii</b>
<b>Acknowledgements</b>	<b>iv</b>
<b>Table of contents</b>	<b>v</b>
<b>List of Tables</b>	<b>ix</b>
<b>List of Figures</b>	<b>x</b>
<b>List of Abbreviations</b>	<b>xi</b>
<b>Abstract</b>	<b>xi</b>
<b>Chapter I: Introduction</b>	<b>1</b>
<b>Chapter II: Review of literature</b>	<b>3</b>
2.1      Phytobiotics	3
2.2      Benefits of phytobiotics	3
2.3      Antibiotics use in poultry ration	4
2.4      Resistance of antibiotics	5
2.5      Potential alternatives of antibiotics	5
2.6      Bioactivities of onion as a growth promoter	5
2.7      Bioactivities of garlic as a growth promoter	6
2.7.1    Actives compounds of garlic	6
2.7.2    Effect of garlic on reduction of cholesterol	7
2.7.3    Garlic reduces metabolic disorders	8

2.7.4	Novel functions of garlic	9
2.8	Importance of the study	9
<b>Chapter III: Material and Methods</b>		<b>10</b>
3.1	Study period and location of the experimental shed	10
3.2	Preparation of poultry shed for the experiment	10
3.3	Experimental design	10
3.4	Collection of day-old chicks (DOC)	11
3.5	Collection of Feed ingredients	11
3.5.1	Collection of onion and garlic	11
3.5.2	Collection of other Feed ingredients	12
3.6	Processing of onion and garlic powder	12
3.7	Feeding standard	12
3.8	Feed formulation and feeding the birds	12
3.9	Managerial procedure	17
3.9.1	Brooding of the chicks	17
3.9.2	Brooder and cage spaces	17
3.9.3	Feeder and drinker spaces	17
3.9.4	Method of feeding, watering and lighting	18
3.9.5	Litter management	18
3.9.6	Bio-security/Sanitation	18
3.10	Record keeping	18
3.10.1	Body weight	18

3.10.2	Feed intake	20
3.10.3	Mortality	20
3.11	Calculation of data	20
3.11.1	Body weight gain	20
3.11.2	Feed intake per week	20
3.11.3	Feed conversion ratio (FCR)	20
3.12	Evaluation of carcass traits	20
3.13	Chemical analysis of onion and garlic containing formulated feed	21
3.14	Collection of blood and serum separation	21
3.15	Blood parameter estimation	23
3.16	Statistical analysis	23
<b>Chapter IV: Results</b>		<b>24</b>
4.1	Body weight gain per week	24
4.2	Feed consumption	24
4.3	FCR	25
4.4	Effect of different diets on carcass quality of broilers	26
4.5	Effect of different diets on blood parameters of broilers	27
<b>Chapter V: Discussion</b>		<b>28</b>
5.1	Weight gain	28
5.2	Feed consumption	28
5.3	FCR	29
5.4	Carcass quality and organ characteristics of broilers	30

5.5	Blood parameters	30
	<b>Conclusion</b>	<b>32</b>
	<b>Recommendation and Future perspectives</b>	<b>33</b>
	<b>Limitations</b>	<b>34</b>
	<b>References</b>	<b>35</b>
	<b>Annex</b>	<b>46</b>
	<b>Brief biography of the author</b>	<b>51</b>



## List of Tables

Tables	Name of the table	Page No.
3.1	: Layout of the experiment	11
3.2	: Feed ingredients used in experimental broiler diets (starter phase)	13
3.3	: Proximate composition of the experimental broiler diets (starter phase)	14
3.4	: Estimated nutritional composition (DM basis) of the experimental broiler starter diets	14
3.5	: Feed ingredients used in experimental broiler diets (grower phase)	15
3.6	: Proximate composition of the experimental broiler grower diets	16
3.7	: Estimated nutritional composition (DM basis) of the experimental broiler grower diets	16
3.8	: Proximate composition of Onion	22
3.9	: Proximate composition of Garlic	22
4.1	: Weekly body weight gain of broilers of different dietary treatment (gm/broiler)	24
4.2	: Weekly feed intake of broilers among different treatment groups (gm/broiler)	25
4.3	: Weekly feed conversion of broilers among different dietary treatment groups	25
4.4	: Weight percentage of primal parts and internal edible organs of broilers at 42 days of age (gm/broiler)	26
4.5	: Different serum constituents level of broilers at 42 days of age	27

## List of Figures

Figure	Name of the figure	Page No.
3.1	: Day old chicks in brooding box	19
3.2	: Mixing of feed ingredients	19
3.3	: Brooding of the chicks	19
3.4	: Feeding of broiler	19
3.5	: Weight measurement of broiler	19
3.6	: Evaluation of carcass traits	19
3.7	: Collection of blood from broiler	19
3.8	: Serum samples for chemical analysis	19

## List of Abbreviations

<b>Abbreviation</b>	<b>Elaboration</b>
%	- Per cent
<	- Less than
>	- Greater than
°F	- Degree Fahrenheit
ANOVA	- Analysis of Variance
BW	- Body Weight
BWG	- Body Weight Gain
CP	- Crude Protein
CRD	- Completely Randomized Design
Ctg.	- Chittagong
CVASU	- Chittagong Veterinary and Animal Sciences University
CY	- Carcass Yield
DOC	- Day Old Chick
EE	- Ether Extract
et al.	- And his associates
etc.	- Et cetera
FC	- Feed Conversion
gm	- Gram
Kcal/Kg	- Kilocalorie per kilogram
kg	- Kilogram
ME	- Metabolizable Energy
MS	- Master of Science
NFE	- Nitrogen Free Extract
NS	- Non-Significant
SEM	- Standard Error of Mean
Sq. Ft.	- Square Feet
US	- United State
Wt.	- Weight

## Abstract

---

A 42 days long feeding trial was conducted to observe the effects of onion and garlic in broiler diet in terms of improving performance, carcass quality and blood parameters of broiler. Total one hundred and four (104) day-old-chicks (Ross 308) were randomly distributed into four dietary treatment groups having 26 birds in each group. T<sub>0</sub> was the control group where no onion and garlic were added. Dietary treatment groups T<sub>1</sub> and T<sub>2</sub> were fed with the onion and garlic @ 1% respectively where T<sub>3</sub> treatment group was fed with the mixture of 0.5% onion and 0.5% garlic. The diets were iso-caloric and iso-nitrogenous for all groups. A significant difference ( $p < 0.05$ ) was found in weekly body weight gain, feed consumption and FCR in different dietary treatment groups at 1<sup>st</sup> and 2<sup>nd</sup> weeks of age. But no significant difference was found in carcass quality (drumstick, thigh, breast, wing, neck, leg, head, liver, heart, gizzard, abdominal fat and neck region fat) and serum constituents (cholesterol, glucose, triglyceride, LDL and HDL) in different dietary treatment groups at 1<sup>st</sup> to 6<sup>th</sup> weeks of age. This study suggested that the use of onion and garlic as feed additives have little effect on overall growth performance in early stage of broiler chicken.

---

**Keywords:** Onion, Garlic, Body weight, Carcass characteristics, Blood parameters.