EFFECT OF SOME FEED ADDITIVES ON PRODUCTIVE PERFORMANCE AND IMMUNE RESPONSE OF QUAIL

By

OSAMA MOHAMED MOHAMED ABO EL-AZAB

B.Sc. Agric. Sc. (Poultry Production), Ain Shams University, 2002

A thesis submitted in partial fulfillment
of
the requirements for the degree of

MASTER OF SCIENCE

in
Agricultural Science
(Poultry Physiology)

Department of Poultry Production
Faculty of Agriculture
Ain Shams University

2010

Approval Sheet

EFFECT OF SOME FEED ADDITIVES ON PRODUCTIVE PERFORMANCE AND IMMUNE RESPONSE OF QUAIL

By

OSAMA MOHAMED MOHAMED ABO EL-AZAB

B.Sc. Agric. Sc. (Poultry Production), Ain Shams University, 2002

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

Dr. Ahmed Mohamed El-Kaiaty ……..…….

Prof. of Poultry Physiology, Faculty of Agriculture, Cairo University

Dr. Yousry Mohammed El-Hommosany ...…….…….

Prof. of Poultry Physiology, Faculty of Agriculture, Ain Shams University

Dr. Nematallah Gamal El-dien Ali .....…….…….

Prof. of Poultry Physiology, Faculty of Agriculture, Ain Shams University

Dr. Ibrahim El-Wardany El-Sayed ….……...…….

Prof. Emeritus of Poultry Physiology, Faculty of Agriculture, Ain Shams University

Date of Examination: 17 / 10 / 2010

EFFECT OF SOME FEED ADDITIVES ON PRODUCTIVE PERFORMANCE AND IMMUNE RESPONSE OF QUAIL

By

OSAMA MOHAMED MOHAMED ABO EL-AZAB

B.Sc. Agric. Sc. (Poultry Production), Ain Shams University, 2002

Under the supervision of:

Dr. Ibrahim El-Wardany El-Sayed

Prof. Emeritus of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

Dr. Nematallah Gamal El-dien Ali

Prof. of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University

Dr. Laila Desoky Abd El-Samee

Associate Research Prof. of Poultry Nutrition, National Research Center

ABSTRACT

Osama Mohamed Abo El-Azab: Effect of Some Feed Additives on Productive Performance and Immune Response of Quail. Unpublished M.Sc. Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2010.

The aim of this study was to overcome the deleterious effects of heat stress on productive and reproductive performance of growing and laying Japanese quail by using some dietary additives, such as organic chromium; organic zinc and mannan oligosaccharides (MOS) alone or with other feed additives. All quail chicks were fed ad libitum on a basal growing diet during the first week of age. After that, a number of 750 quail chicks were assigned randomly and equally to ten dietary treatment groups. After 8 weeks of age, 25 birds from each group were taken randomly and continued on their treatments to study the effects of treatments on egg production and egg quality. The first group was received a basal diet without any supplement and saved as control group. The second and third groups were fed the basal diets supplied by organic chromium (600 mg or 1200 mg of chromium yeast), the forth and fifth groups were fed the basal diets supplied by organic zinc (20 mg or 40 mg of Bio-plex zinc), the sixth group was fed the basal diet supplemented with 1 g/kg of MOS. The other groups (from seventh to tenth) were similar to groups from second to fifth, but MOS was added to these diets by 1 g/kg.

Data were collected to determine the effect of different treatments on productive and reproductive performance, blood constituents and humoral immune response against SRBCs.

The results showed that live body weight, body weight gain and feed consumption were improved as response to adding the low level of organic chromium or the prebiotic (MOS) or their combination. Feed conversion was numerically improved in all treatment groups. Egg production and hatchability percentages were significantly improved especially in laying quails that fed Zn-supplemented diets, a similar trend was also obtained for chromium and MOS diets and their combination. Egg weight, egg mass and exterior and interior egg quality traits were insignificantly influenced by different treatments. Humoral immune response of growing quails against SRBCs challenge was significantly improved in quails that fed Zn or MOS supplemented diets or their combinations. Plasma total proteins, albumin and globulin of growing quails were significantly influenced by different treatments, but in laying period, plasma total protein did not significantly affected. Plasma total lipids and plasma cholesterol levels of growing quails were significantly decreased for Cr or MOS diets or their combination. Liver enzymes activity (AST, ALT) and thyroid hormone (T3) levels were significantly increased by dietary treatments, especially with zinc and chromium.

It could be concluded from the present study that, dietary supplementation with chromium yeast (600 mg or 1200 mg/kg diet), low level (20 mg/kg diet) of organic zinc, MOS with a level of 1 g/kg diet or a combination of these additives may be used as alternatives to pharmacological growth promoters, for enhancing productive and reproductive performance of growing and laying quails**.**

Key words:

Quail, chromium yeast, zinc, prebiotic, performance, immune response

ACKNOWLEDGMENTS

First of all, all praises and limitless thanks to *My God* who gives me the capability to complete this study.

I would like to express my deep personal gratitude and sincere appreciation to **Prof. Dr. Ibrahim El-Wardany El-Sayed,** Professor of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, for his supervision, suggesting the problem, valuable advices and help during the whole period and in revising the manuscript to be in its final form.

My deep gratitude is extended to **Dr. Laila Desoky Abd El-Samee,** Associate Professor of Poultry Nutrition, Department of Animal Production, National Research Centre, for her valuable advise, suggesting the problem, continuous help, co- operation, providing the facilities, revising the manuscript and moral support during this work.

I wish to express my deepest thanks to **Prof. Dr. Neamat-Allah Gamal El-Din Ali,** Professor of Poultry Physiology, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, for her valuable advices**,** co- operation, encouragement and constant interest throughout this work.

I would like to express my deep thanks to all the staff members of the Department of Poultry Production, Faculty of Agriculture, Ain Shams University and the Department of Animal Production, National Research Center, for their support and kind help.

I wish to express my deepest appreciation to my mother, my wife and all members of my family for continuous support, help and credible encouragement.

Finally, I wish to provide my thanks to my dear friend **Mohamed Ibrahim Shourrap**, Assistant Professor of Poultry Physiology, Faculty of Agriculture, Ain Shams University, for helping me during this study.

CONTENTS

Page

LIST OF TABLES

LIST OF ABBREVIATIONS

A/G	:	Albumin to Globulin ratio
ALT	:	Alanine aminotransferase
AST	:	Aspartate aminotransferase
BW	:	Body weight
BWG	:	Body weight gain
°C	:	The degree Celsius
Cr	:	Chromium
CrPic	:	Chromium Picolinate
FC	:	Feed conversion
FCR	:	Feed conversion ratio
g	:	gram
GIF	:	Growth Inhibitory Factor
GLM	:	General Linear Models
h	:	Hour
HA	:	Haemagglutinin
Ig	:	Immuno-globulin
Kcal	:	Kilo calorie
Kg	:	Kilo gram
L	:	Liter
LBW	:	Live body weight
M.E.	:	Metabolizabole energy
Meth	:	Methionine
mg	:	Mille gram
min	:	Minutes
MOS	:	Mannan oligosaccharides
µg	:	Micro gram
(P)	:	Prebiotic
ppb	:	Part per billion
ppm	:	Part per million

PTP	:	Plasma Total Proteins
RBCs	:	Red blood cells
RH	:	Relative humidity
RIA	:	Radio-immune-assay
r.p.m	:	Revolution per minute
SCWL	:	Single Comb Wight Leghorn
SRBCs	:	Sheep red blood cells
T4	:	Thyroxine
T3	:	Triiodothyronine
wk	:	Week
woa	:	Week of age
Zn	:	Zinc
%	:	Percent