

Cairo University
Faculty of Veterinary Medicine
Microbiology Department



**Studies on the efficacy of lactobacilli on the immune status
and performance of broiler chickens**

A Dissertation presented by
Kamal Hossein Ab El-Tawab Zidan
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Under the supervision of

**Prof. Dr.: Khald Farouk
Mohamed Al Amry**
Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University

**Prof. Dr.: Mahmoud Essam
Hatem Ahmed**
Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University

**Prof. Dr.: Iman Bakr Mohamed
Khedr**
Professor of Pathology and Vice
Dean of Postgraduate
and Researches
Faculty of Veterinary Medicine
Cairo University

**Prof. Dr.: Ausama Abd El-Raouf
Abd El-Moneim Yousif**
Professor and Head of Virology
Department
Faculty of Veterinary Medicine
Cairo University

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Cairo University
Faculty of Veterinary Medicine
Department of Microbiology



Approval Sheet

This is to certify that the dissertation submitted by Vet.\ **Kamal Hossein Abdel-Tawab Zidan**, for the Ph.D. degree of Veterinary Medical Sciences, Microbiology (Bacteriology, Immunology and Mycology) has been approved by the examining committee.

- **Professor Dr.\ Fawzy Reyad Mahammed El-Saedy** *F. A. El-Saedy*
Professor of Microbiology
Faculty of Veterinary Medicine
Beni-Suef University
- **Professor Dr.\ Jakeen Kamal Abd Alhaleem El- Jakee** *J*
Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University
- **Professor Dr.\ Khaled Farouk Mohamed Al-Amry** *K*
Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University
- **Professor Dr.\ Iman Bakr Mohamed Khedr** *Iman shahred*
Professor of Pathology and Vice Dean of Postgraduate and Researches
Faculty of Veterinary Medicine
Cairo University
- **Professor Dr.\ Ausama Abd El-Raouf Abd El-Moneim Yousif** *Ausam Yousif*
Professor and Head of Virology Department
Faculty of Veterinary Medicine
Cairo University

Dated: 16/1/2016

Supervision Sheet

Professor Dr.: Khald Farouk Mohamed Al Amry

Professor of Microbiology

Faculty of Veterinary Medicine

Cairo University

Professor Dr.: Mahmoud Essam Hatem Ahmed

Professor of Microbiology

Faculty of Veterinary Medicine

Cairo University

Professor Dr.: Iman Bakr Mohamed Khadr

Professor of Pathology and Vice Dean of Postgraduate and Researches

Faculty of Veterinary Medicine

Cairo University

Professor Dr.: Ausama Abd El-Raouf Abd El-Moneim

Yousif

Professor and Head of Virology Department

Faculty of Veterinary Medicine

Cairo University

Name: **Kamal Hossein Abdel-Tawab Zidan**

Date of birth: 20- 4- 1974

Nationality: Egyptian

Degree: Philosophy of Doctor in Veterinary Microbiology

Specification: Microbiology.

Title of research: **Studies on the efficacy of lactobacilli on the immune status and performance of broiler chickens.**

Abstract

This research was initiated with the objective of producing a local probiotic formulation and application programs to further improve broiler production economics and safety. Four isolates of lactobacilli were recovered and characterized biochemically, and genetically, based on the rRNA gene from the gut of mature healthy broilers. *L. johnsonii*, *L. plantarum*, *L. crispatus* and *L. reuteri* were selected and mixed with an equal volume and approximate dose of 10^8 CFU/chick was tested. The safety of oral administration of the characterized lactobacilli was established in broilers. An innovative media from chicken feed for propagation of lactic acid producing bacteria was devised to reduce the cost of local commercial production of probiotics. A probiotic application protocol was suggested. Single and two-time probiotic applications (at 0 day or at 0 and 10 days) were tested in groups of broiler chicks reared under field conditions and fed antimicrobials- and anticoccidial- free rations. The modified whey broth surpasses MRS and feed extract media. Performance parameters and antibody immune responses were measured with, and without microbial challenge in two experiments. *Clostridium perfringens* type A was used in challenging bird (10^9 CFU/chick). Higher performance parameters, reduced disease impact and improved histopathological picture of intestine were reported in groups receiving probiotic. Non significant changes in antibody responses were observed. Data analysis shows that an overall 8% increase in broiler production can be achieved using the double dose application approach of the probiotics. A significant ($P \leq 0.05$) risk reduction of *C. perfringens* challenge can be achieved using either one or double dose application approach of the probiotics and conclusions pertaining the use and possible production economics were drawn.

Keywords: Chicken, *Clostridium*, Histopathology, *Lactobacillus*, Poultry, Probiotic.

Dedication

*To my mother, my father,
brothers, sisters,
wife and lovely babies*

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