



Cairo University
Faculty of Veterinary Medicine



**Bacteriological and Molecular Studies on Multidrug
Resistant Bacteria Isolated from Poultry and
Poultry Products**

A Thesis submitted by

Nesma Mohamed Kamel Ali

(B.V.Sc., Cairo University, 2010, M.V.Sc., Cairo University, 2015)

**For the Ph.D. Degree in Veterinary Medical Sciences
(Microbiology)**

Under the supervision of

Prof. Dr. Heidy Mohamed Shawky

Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Ahmed Samir Mohamed Dr. Eman Mohamed Farghly

Professor of Microbiology
Faculty of Veterinary Medicine
Cairo University

Chief researcher in Reference Lab.
for Quality Control of Poultry
Production
Animal Health Research Institute
Dokki , Giza ,Egypt

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Cairo University
Faculty of Veterinary Medicine
Department of Microbiology

Name: Nesma Mohamed Kamel Ali **Nationality: Egyptian**
Date of birth: 15/11/1987. **Place of birth: Cairo**
Degree: Ph.D.in Veterinary Medical Science. **Specification: Microbiology**
(Bacteriology, Immunology and Mycology).

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Abstract

This study investigated the incidence of multi-drug resistant (MDR) organisms in poultry and poultry products in Egypt. From a total of 300 poultry and poultry product samples 25, 20, 15, and 10 isolates were recognized as *Salmonella* spp., *E.coli*, *S.aureus* and *E.faecalis* by bacteriological and molecular methods. Studying antibiotic sensitivity pattern of the bacterial isolates , multidrug resistance to three or more classes of antimicrobial groups was observed in 9 (36%), 18(90%), 15(100%), and 9 (90%) isolates of *Salmonella* spp., *E.coli*, *S. aureus* and *E. faecalis*, respectively. *E. coli* and *Salmonella* isolates were tested for its susceptibility against 14 different antibiotics; the highest resistance rates in *E. coli* were recorded against tetracycline, chloramphenicol , ampicillin, and sulphamethoxazole-trimethoprim with resistance rates of 90% , 85% ,80% and 80 % ,respectively.The highest sensitivity rates were detected for amikacin , cefuroxime and ampicillin-sulbactam with sensitivity rates 100%, 75% and 70% , respectively. In *Salmonella* isolates increased resistance to cefotaxime and tetracycline with a percentage of 80% and 64% was detected, respectively. Also the highest sensitivity rates were detected for amikacin and ampicillin-sulbactam with sensitivity rates of (92%), and (88%) for amoxicillin clavulanate and ceftazidime. The antibiotic susceptibility pattern of *S.aureus* was studied against 12 different antibiotics. The highest resistance rates were detected against methicillin, pencillin, erythromycin and azithromycin with resistance rates of (100%) and (80%) for gentamycin . The highest sensitivity rate was detected towards vancomycin with a percentage of 80%. In enterococci (100%) of the strains were resistant to clindamycin and ampicillin, (80%) for rifampin and 70% for tetracycline. The highest sensitivity rates were detected to pencillin and

vancomycin with a percentage of 80% and 60%, respectively. Serotyping of *Salmonella* spp. in chicken revealed that *S. Enteritidis* was the most isolated strain followed by *S. Infantis* (21.4%), *S. Kentucky* (14.2%) and *S. Typhimurium*, *S. Kapemba*, *S. Newport*, *S. Vejle* and *S. Magherafelt* were equally identified. *S. Infantis* was the most common strain detected in chicks (60%), while in ducks *S. Typhimurium* and *S. Blegdam* were equally identified. In ducklings, *S. Sinchew*, *S. Infantis* and *S. Sekondi* were equally identified. Only *S. Newmexico* was identified in poultry products. Isolates of *E. coli* recorded in chicken were serogrouped into O1, O8, O29, O125, O128 and O157. In chicks, O29 and O126 serotypes were detected. In poultry products only O8 was detected. Molecular detection for antibiotic resistance genes revealed that *bla*_{TEM} being the predominant β -lactamases detected in *Salmonella* spp. and *E. coli*. While *mecA* was detected in all *S. aureus* isolates (all are Methicillin resistant *Staphylococcus aureus*). For enterococcus *vanA* gene was detected in 3 isolates (30%), no *vanB* was detected. The results indicate that frequency of multi-drug resistant organisms has reached an alarming level in poultry isolates in Egypt. It significantly points to the great need to evaluate and monitor the incidence rate of multi-drugs resistant organisms.

Key words: MDR, *E. coli*, *mecA* gene, poultry, poultry products, *Salmonella*.

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