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Bacteria associated with early mortalities in broiler farms with regard to antibiotics and disinfectants resistance genes

A thesis submitted by

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Abstract

Antibiotics and disinfectants' resistant Gram-negative bacteria represent a major risk on the broiler chicks especially during the first ten days of the rearing cycle, mainly *Salmonella*, *E. coli*, and *Pseudomonas aeruginosa* as they contribute as major causes of early mortalities in broiler farms.

We aimed in this study to shed light on these main three bacterial pathogens through detection of their prevalence, sensitivity range against the different antimicrobials, and resistance genes that hinder the efficacy not only of some antibiotics but also of Quaternary Ammonium Compounds that are widely used to eliminate them.

Five hundred samples (liver, yolk sac, cecum, spleen and heart) from freshly dead affected chicks (1-10 days old) were cultured on different media for the isolation of causative agents by conventional and serological methods.

PCR was used for the detection of resistance genes. The Bacteriological examination revealed the presence of *Salmonella* spp., *E. coli*, and *P. aeruginosa* in the percentages of 23, 25 and 8%, respectively. Single and mixed infections were observed as 41, and 7%, respectively. We found that 86.9% of *Salmonella* serovars were resistant to colistin sulphate, 48% of *E. coli* strains showed resistance against norfloxacin, and 87.5% of *P. aeruginosa* showed resistance against florfenicol.

The *mcr1* gene was found in 86.9% of all *Salmonella* serovar, *qnrS* gene was detected in 16% of *E. coli*, and *floR* gene was present in 100% of *P. aeruginosa* isolates. PCR screening for *qacED1* revealed that all bacterial isolates under test were positive.

The single and mixed experimental bacterial infections of twenty-five one-day-old broiler chicks classified into five groups revealed that the mixed bacterial infection represents a high risk on the broiler chicks than the single infection.

It was concluded that the existence of *mcr1*, *qnrS*, *floR*, and *qacED1* genes among (*Salmonella* spp., *E. coli*, and *P. aeruginosa*) which were isolated from early aged broiler dead chicks that represents a high risk on the poultry industry in Egypt.

Keywords: *Salmonella serovars, E. coli serotypes, P. aeruginosa, mcr1, qnrS, floR, qacED1,* dead broiler chicks, experimental infections.

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