



Cairo University



**Cairo University
Faculty of Veterinary Medicine
Department of Veterinary Hygiene and Management**

**Hygienic Evaluation of Some New Formulations Used for
Treatment and Disinfection of Drinking Water in Poultry
Houses.**

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Abstract

Drinking water contamination and biofilm development in water lines became a serious problem facing poultry farms. They posed a threat for water born disease dissemination between flock and hazard associated with poultry product. The present study investigates the microbial load of poultry drinking water and examine the ability of these pathogens to develop a biofilm on Polyvinyl chloride (PVC) surface. Furthermore, evaluates the bactericide and biofilmicide effect of organic acids (OAs) water additives against planktonic cells and biofilm. Finally, determines the impact of prolonged usage of acidified water contain different organic acids of single or mixture forms on the broiler growth performance, intestinal histopathology, and their effect on immune system modulation. This study was carried out in three stages, firstly water samples were collected from different poultry farms for microbiological examination, the isolated bacteria serotyped into *Salmonella Kentucky* and *Pseudomonas aeruginosa* which have public health significant. Secondly, the laboratory experiment, where the PVC coupons were immersed into test water contain a single strain of the isolating bacteria and incubated for biofilm growth. After incubation, the vital planktonic cells were counted, and biofilm growth

on PVC coupons detected by crystal violet staining, and biofilm cells collected using swabbing method followed by total colony count (TCC). Different Organic acids in single and mixture forms were evaluated against planktonic cells and pre-formed biofilm for 1-hour contact time. Thirdly, field trial on 450 commercial broiler chicks (Arbor acres breed) divided into 9 treated and control groups. Treated groups supplemented with acidified water for 12 hours/ day during the whole trial while the control group consumed normal water. The results showed the positive effect of organic acid as bactericide and biofilmicide agent. Besides, the great impact on broiler performance by significant increase the final body weight with low feed conversion ratio (FCR) against control. Interestingly, feed and water intake were not affected by acidified water. Moreover, immunomodulator effect by enhancing and modulating bird humoral and non-specific general immune response producing high protected level of antibody against vaccination with NDV and injected sheep red blood cells (SRBCs). In addition, noticed that mortality rate was reduced in treated groups than control. In conclusion, organic acids can be used as effective antimicrobial and biofilmicidal agent in water sanitation program. Continuous using organic acids as water additive in poultry drinking water during production cycle ensure that water should be sanitize against microbial pathogens and inhibit biofilm formation, besides achieving optimum broiler performance.

Keywords: organic acids, acidified water, biofilm, antimicrobial, biofilmicide, broiler performance, immune modulation.

DEDICATION

I dedicate this work to my dear kind parents ; for all their efforts, love and help in all my life, my husband; for being in my life and supporting me, my two lovely daughters for all their suffering with me and my brothers and sister for their encouragement

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List of Contents

Title	Page
1-Introduction	1
2-Review Article	4
3- Paper (1) Title: Antimicrobial and biofilmicidal efficacy of organic acids against <i>Salmonella</i> and <i>Pseudomonas</i> strains recovered from drinking water of broiler farms.	28
4- Paper (2) Title: Effect of Acidified Drinking Water by Organic Acids on Broiler Performance and Gut Health	49
5- paper (3) Title: Modulation of Broiler Immune Response by Organic Acids	71
6-- Discussion	93
7-Conclusion & Recommendation	104
8- English Summary	106
9- References	110
10- Arabic Summary	1

List of tables

No. of Table	Title	Page. No.
Review article		
1	Microbial water standard	5
2	PKa value of commonly used organic acid	16
Paper 1 Antimicrobial and biofilmicidal efficacy of organic acids against <i>Salmonella</i> and <i>Pseudomonas</i> strains recovered from drinking water of broiler farms.		
1	Chemical analysis of water sample	33
2	Organic acid used in experiment	36
3	Biofilmicidal effect of organic acid treatment on <i>Salmonella kentucky</i> biofilm on PVC coupon and <i>Salmonella kentucky</i> planktonic cells.	37
4	Biofilmicidal effect of organic acid treatment on <i>Pseudomonas aeruginosa</i> biofilm on PVC coupon and <i>Pseudomonas aeruginosa</i> planktonic cells	38
Paper 2 Effect of Acidified Drinking Water by Organic Acids on Broiler Performance and Gut Health		
1	Organic acids used in the experiment.	53
2	The Schedule of chicks' vaccination program	53
3	Effect of added 1% single organic acids on growth performance in broilers during 35 days of experiment	56
4	Effect of added 1% mixture of organic acids (mixture of equal ratio to make 1% concentration) on growth performance in broilers during 35 days of experiment.	56