

## Contents

Introduction.....	1
Study 1: Assessment of disinfectants performance procedures (Applied in small sector of Egyptian poultry farms)	
1.1 Socioeconomic importance of the small sector poultry production in Egypt.....	4
1.2 Importance of cleaning and disinfection process in small sector poultry production	5
1.3 Traditional disinfectants which used in small sector poultry production.....	7
Materials and Methods.....	14
Results.....	22
Discussion.....	26
Study 2: Efficiency of some disinfectants against biofilm present in poultry farm	
2.1 Importance of biofilm in Cleaning and disinfection.....	31
2.2 Water lines biofilm problem.....	35
2.3 Galvanized wire biofilm problem.....	36
2.4 Susceptibility of planktonic and biofilm to disinfectants.....	38
Materials and methods.....	44
Results.....	53
Discussion.....	59
Study 3: Efficacy of a novel foot pan in biosecurity protocols	
3.1 Importance of foot bath in poultry farm biosecurity.....	66
3.2 Disinfectant which used in foot bath.....	69
Materials and methods.....	74
Results.....	79
Discussion.....	93
Conclusion.....	99
Summery.....	101
References.....	104
List of Abbreviations.....	129
Arabic summery.....	130

## List of Tables

Table number	Title	Page
<b>Study 1: Assessment of Disinfectant Performance Procedures (Applied in Small sector of Egyptian poultry farms)</b>		
Table 1	The different disinfection programmes in the three experimental poultry pines	14
Table 2	Disinfectants which used in the three experimental poultry pines	20
Table 3	Performance of disinfecting programs on walls	22
Table 4	Performance of disinfecting programs on floor	23
Table 5	Performance of disinfecting programs on roof.	24
Table 6	Performance of disinfecting programs on air	25
<b>Study 2: Efficiency of some disinfectants against biofilm in poultry farm</b>		
Table 7	Microbiological examination of the tested water	45
Table 8	Chemical examination of the tested water	45
Table 9	Disinfectants and detergents which used for removal of the biofilm on galvanized wire	50
Table 10	Disinfectants and detergents which used for removal of biofilm on PVC	51
Table 11	Disinfectants and detergents efficiency against <i>Salmonella</i> biofilm on galvanized wire after 10 minutes	53
Table 12	Disinfectants and detergents efficiency against <i>Pseudomonas</i> biofilm on galvanized wire after 10 minutes	54
Table 13	Disinfectants and detergents efficiency against <i>Salmonella</i> biofilm on PVC after 24 hours	56
Table 14	Disinfectants and detergents efficiency against <i>Pseudomonas</i> biofilm on PVC after 24 hours	57
Table 15	Disinfectants and detergents efficiency against Planktonic bacteria formation on PVC after 24 hours	58
<b>Study 3: Efficacy of a novel foot pan in biosecurity protocols</b>		
Table 16	Diluents used in foot pan	75
Table 17	Disinfectants used in foot pan	76
Table 18	Longevity of calcium hypochlorite in different models of foot pan as 5% chlorine is a starting point (Chlorine concentration)	79
Table 19	Longevity of calcium hypochlorite in different models of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	80

Table 20	Efficiency of calcium hypochlorite in different models of foot pan as 5% chlorine is a starting point for <i>Salmonella</i> log reduction.	81
Table 21	Longevity of Halamid in different models of foot pan as 5% chlorine is a starting point (chlorine concentration)	82
Table 22	Longevity of Halamid in different models of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	83
Table 23	Longevity of Halamid in different models of foot pan as 5% chlorine is a starting point for <i>Salmonella</i> log reduction	84
Table 24	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point (Chlorine concentration)	85
Table 25	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	86
Table 26	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point for <i>Salmonella</i> log reduction	87
Table 27	Longevity of Paraformaldehyde in different model of foot pan as 5% Formaldehyde is a starting point for (Formaldehyde concentration)	88
Table 28	Longevity of Paraformaldehyde in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	89
Table 29	Longevity of Paraformaldehyde in different model of foot pan as 5% chlorine is a starting point for <i>Salmonella</i> log reduction	90
Table 30	Longevity 2% Virkon diluted with slaked lime (calcium carbonate) as a dry foot model	91
Table 31	Longevity 2% Virkon diluted with sodium chloride as a dry foot model	91
Table 32	Longevity 2% Virkon diluted with surfactant as a semi liquid foot model	91
Table 33	Longevity 2% Virkon S diluted with surfactant as a Floor mat	91
Table 34	Longevity 5% Virkon diluted with slaked lime (calcium carbonate) as a dry foot model	91

Table 35	Longevity 5% Virkon diluted with sodium chloride as a dry foot model	91
Table 36	Longevity 5% Virkon diluted with surfactant as a semi liquid foot model	92
Table 37	Longevity 5% Virkon S diluted with surfactant as a Floor mat	92

## List of figures

Figure number	Title	Page
Study 1: Assessment of Disinfectant Performance Procedures (Applied in Small sector of Egyptian poultry farms)		
Figure 1	Performance of disinfecting programs on walls	22
Figure 2	Performance of disinfecting programs on floor	23
Figure 3	Performance of disinfecting programs on roof	24
Figure 4	Performance of disinfecting programs on air	25
Study 2 : Efficiency of some disinfectants against biofilm in poultry farm		
Figure 5	Galvanized wire (poultry cages)	45
Figure 6	Water pipes (drinking system in poultry farm)	46
Figure 7	control positive and control negative with gram stain on galvanized wire	48
Figure 8	control positive and control negative with gram stain on PVC	49
Figure 9	Disinfectant and detergents efficiency against <i>Salmonella</i> biofilm on the galvanized wire	55
Figure 10	Disinfectants and detergents efficiency against <i>Pseudomonas</i> biofilm on the galvanized wire	55
Figure 11	Disinfectants and detergents efficiency against <i>Salmonella</i> biofilm on PVC	56
Figure 12	Disinfectants and detergents efficiency against <i>Pseudomonas</i> on PVC	57
Figure 13	Disinfectant and detergents efficiency against Planktonic bacteria which formed on PVC	58
Study 3: Efficacy of a novel foot pan in biosecurity protocols		
Figure 14	Dry foot pan model	74
Figure 15	Semi liquid foot pan model	75
Figure 16	Floor mat model	75
Figure 17	Longevity of calcium hypochlorite in different model of foot pan as 5% chlorine is a starting point (Chlorine concentration)	79
Figure 18	Longevity of calcium hypochlorite in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	80
Figure 19	Longevity of calcium hypochlorite in different model of foot pan as 5% chlorine is a starting point for <i>Salmonella</i> log reduction.	81

Figure 20	Longevity of Halamid in different model of foot pan as 5% chlorine is a starting point (chlorine concentration)	82
Figure 21	Longevity of Halamid in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	83
Figure 22	Longevity of Halamid in different model of foot pan as 5% chlorine is a starting point for Salmonella log reduction	84
Figure 23	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point (Chlorine concentration)	85
Figure 24	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	86
Figure 25	Longevity of Staldren in different model of foot pan as 5% chlorine is a starting point for Salmonella log reduction	87
Figure 26	Longevity of Paraformaldehyde in different model of foot pan as 5% Formaldehyde is a starting point for (Formaldehyde concentration)	88
Figure 27	Longevity of Paraformaldehyde in different model of foot pan as 5% chlorine is a starting point for aerobic bacteria log reduction	89
Figure 28	Longevity of Paraformaldehyde in different model of foot pan as 5% chlorine is a starting point for Salmonella log reduction	90

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**Title of the research:** The efficiency of disinfectants and disinfection programs commonly adopted in poultry farms in Egypt

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**To refer this thesis:** May F.(2017). The efficiency of disinfectants and disinfection programmes commonly adopted in poultry farms in Egypt Thesis submitted in fulfillment of the requirements of the degree of Doctor (Ph.D.) in Veterinary Sciences, Faculty of Veterinary Medicine, Cairo University.

Abstract

This study aimed to evaluate the cleaning and disinfection programmes in small scale of poultry production houses. Every procedure in cleaning and disinfection has a role to achieve the standard optimization for disinfection process. Local disinfectants Egyptian should be evaluated periodically for the efficiency and validity of active material. The use of Foam technique and the addition of chlorine to surfactant in cleaning process produced an excellent result. Biofilm is a problem in poultry farm which could be developed in water pipes and the cages of the birds. Plankton could be developed on the water pipes by the water which has a high microbial load. Disinfection process must be done periodically to remove the biofilm and the plankton by Clorox 2.5% or Calcium hypochlorite 1%. Also, this study aimed to replace liquid foot pan in the poultry farm, with a novel model using dry disinfectants as Calcium hypochlorite, Staldren, Halamid, Paraformaldehyde and Virkon S that is used more effectively in biosecurity program convenient with the workers in Egyptian farms that avoid the ordinary foot pan.

Key words: Sanitation - disinfection - cleaning - biofilm - foot pan -  
*Salmonella* - *Pseudomonas* -plankton - total colony count.

## Summery

This thesis consists of three different studies about the disinfection programmes and the efficiency of the disinfectants in poultry farms.

The first study was about three different disinfection programs were applied in the three poultry (pines) houses in faculty of veterinary medicine at Cairo University which simulate small scale Egypt poultry farm sector using available traditional materials that easily obtained from Egyptian market. In the cleaning process we used surfactants, foam technique and 5 % chlorinated surfactant in Program A, B, C respectively and in the disinfection process we used quick lime mixed with cresol, quick lime mixed with Calcium hypochlorite and quick lime mixed with cresol and Calcium hypochlorite in program A, B, C respectively. The disinfection programs take three days, at the first day swabs were taken before applications, after whipping (Dry cleaning) and after applying water with high pressure directly (Wet cleaning), swabs after applying the detergent with brushing directly twice, after rinsing with water immediately. At the second day, swabs were taken after 24 hours from rinsing, swabs were taken after an hour from application the disinfectant. At the third day swabs were taken after 24 hours from applying the disinfectants. Fifteen swabs were taken from (walls, floor and roof) 5 swabs per each and the log mean of the average of each five was calculated and was obtained in each step. It concluded that the three programs were effective and successful as all of them achieved the reduction which is the standard optimization for the disinfection process. The use of the foam technique in cleaning process produced an excellent result; also the addition of chlorine to the surfactant achieved an observable reduction in microbial viability. Local Egyptian market products disinfectant present and produce in Egyptian market should be evaluated periodically as they may be devalued or less in their active material.

The second study, regarding to biofilm, this study aimed to produce biofilm in vitro on two substrate (galvanized wire, PVC), also to perform plankton on the PVC to mimic the condition in the poultry farm), then evaluate the efficiency of the disinfectants to remove it. The average of initial



*Salmonella* count log on the tested coupons was Log 10.3. While the primary average *Pseudomonas* count log was log 9 on the galvanized wire. Referring to average *Pseudomonas* count was 10.1. While on the PVC the average *Salmonella* count of the tested PVC coupons was 11, the bacterial count of plankton which recovered on the PVC coupons after 7 days was log 8. Only three disinfectants removed the bacterial count to zero cfu/cm<sup>2</sup> which are Clorox 2.5%, Pril 2%+ Clorox 2.5% and Formalin 5% in case of *Salmonella* and *Pseudomonas* which formed on the galvanized wire coupons.

The disinfectants which used in water pipes were Cupper sulphate 1%, Halamid 1%, Virkon S 1%, Formic acid 1%, Acetic acid 1%, Sulphamic acid 1%, Citric acid 1%, Clorox (25 ml per Liter), Calcium hypochlorite 1%, Clean Zix 0.7%, Dyne O might (1part:400part), Sodium hydroxide 1%, Iodocide 3%, Zix Virox 0.2%. All used disinfectants have the ability to remove *Salmonella* and *Pseudomonas* biofilm completely from water lines in poultry farm except Iodocide 3%, Zix virox 0.2% and sodium hydroxide 1%. All used disinfectants removed the planktonic bacteria completely except iodocide 3%, and zix virox 0.2%.

The third study aimed to replace liquid foot pan in the poultry farm, with a novel models that is used more effectively in biosecurity program convenient with the workers in Egyptian farms that avoid foot pan. These novel models are dry foot pan, semiliquid (wet) foot pan and floor mat that enabled the disinfectants to be worked for a longer time. We are looking for a durable footbath, stable, fast, easily applied and log acting in the reduction of aerobic bacteria and *Salmonellae*. The efficacy of powder disinfectants (Calcium hypochlorite powder, Halamid, Staldren, Virkon S and paraformaldehyde) were tested against aerobic bacteria and *Salmonellae* in a novel form of foot pan dry, semi-liquid and floor mat models. The disinfectants were diluted by calcium carbonate or sodium chloride powder in the dry form, surfactant in the semiliquid form and use of the sponge as a mat in the third form. Daily measurement of the active principle of the tested disinfectants and the log reduction of the *Salmonellae* were done. The dry form and semi liquid form of

the Calcium hypochlorite was successfully effective against aerobic bacteria and *Salmonella* for 8 days in dry form and 9 days in semiliquid form. However, Halamid and Staldren were successfully effective in dry form for 12 days and 13 days respectively, semiliquid form was worked for 21 days and 3 days and floor mat was effective for 21 days and 3 days respectively. Paraformaldehyde powder was also effective for 5 days in the dry form, but in the semiliquid form was effective for 7 days, floor mat was effective for 7 days. 5% Virkon S could be effective for 3 days in the dry form and semi-liquid form but only 2 days in the floor mat form.