Epidemiological Surveillance on Environmental Contaminants in Poultry Farms

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Abstract: A total of 416 environmental samples (litter, water, swabs and air) were collected from commercial poultry farms located in Ismailia and Zagazig Governorates during the period January through July of 2008. These samples were tested by conventional cultural methods and then were confirmed biochemically. The bacterial isolates that were identified included: Citrobacter spp., E. coli, Klebsiella oxytoca, Proteus vulgaris, Pseudomonas aureuginosa, Salmonella sp, Shigella sp, Staphylococcus aureus, Streptococcus fecalis and Streptococcus pneumoniae. The suspected colonies for Salmonella spp. were cultured onto a selective media (Selenite F broth and S-S agar) for further confirmation. Prevalence and frequencies of the microorganisms were calculated to detect the most predominant microorganisms. Swab samples showed higher prevalence of bacterial isolates (37.7%). Samples collected from closed house system had higher prevalence of bacterial isolates in swab samples (20.5%) as compared to samples from open house system (17.2%). Citrobacter sp (8.3%), Proteus vulgaris (8.3%) and Pseudomonas aureuginosa (16.7%) predominated in litter samples from closed house system. E. coli (35.7%) predominated in air samples of closed house system. Klebsiella oxytoca (10.0%) predominated in water of open house system. Salmonella sp (35%) predominated in swab samples of open house system. Shigella sp prevalence was similar between water samples of opened house system (6.0%) and swab samples of closed system (5.9%). Staphylococcus aureus (50.0%) predominated in air of closed house system. Streptococcus pneumoniae (17.8%) predominated in air samples of open house system. Streptococcus fecalis (5.3%) predominated in litter samples of open house system. A total of 266 environmental and non-environmental samples were collected during the period September of 2008 through January of 2009 by the Alabama State Veterinary Diagnostic Laboratory as part of the National poultry improvement plan. These samples were examined using highly selective media for Salmonella sp. The positive samples were confirmed biochemically and sero-grouped. The highest prevalence of Salmonella spp. was in environmental swabs (38.6%) with special reference to slat swabs (10.2%), fans (8.1%) and sills (6.9%). The highest predominant group of Salmonella spp. was C3 (50.4%) followed by group B (24.0%) and group C2 (13.9%).

Key words: Salmonella, surveillance, epidemiology, poultry
Evaluation of Commercial Disinfectants Against Bacterial Pathogens Isolated from Broiler Farms

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Abstract: Five disinfectants [TH4® (combination of quaternary ammonium compounds and gluteraldhyde), Microzal® (combination of quaternary ammonium compounds and gluteraldhyde), Incospect IC 22XA (combination of quaternary ammonium compounds, gluteraldhyde and formalin), Povidone Iodine® (iodophore) and Formalin® (commercial formaldehyde 37%) were tested in a laboratory trials against four bacterial isolates (Staphylococcus aureus, Escherchia coli, Klebsiella oxytoca and Pseudomonas aureuginosa) at concentration of (~10^5) isolated during epidemiological surveillance. The trials were carried in the presence and absence of organic matter (dried yeast 5%) using MIC use-dilution test. Minutely samples were collected for the bacterial counts. In the absence of organic matter, TH4® achieved the 100% killing efficacy against Staphylococcus aureus, Escherchia coli, Klebsiella oxytoca and Pseudomonas aureuginosa after 5, 5, 10 and 5 min (p<0.0001) respectively, Microzal® and Incospect IC 22XA achieved the 100% killing efficacy against the four microorganisms after 5 min (p<0.0001), Povidone Iodine® achieved the 100% killing efficacy after 5, 5, 5 and 10 min (p<0.0001) respectively and Formalin® achieved the 100% killing efficacy after 5, 5 and 10 min (p<0.0001) respectively. In the presence of organic matter, TH4® achieved the 100% killing efficacy against Staphylococcus aureus, Escherchia coli, Klebsiella oxytoca and Pseudomonas aureuginosa after 10, 5, 20 and 20 min (p<0.0001) respectively, Microzal® and Incospect IC 22XA achieved the 100% killing efficacy after 5, 5, 5 and 10 min (p<0.0001) respectively, Povidone Iodine® achieved the 100% killing efficacy against the four microorganisms after 30 min (p<0.0001) and Formalin® achieved the 100% killing efficacy after 30, 5, 20 and 20 min (p<0.0001) respectively. The results revealed that quaternary ammonium-gluteraldhyde combination (TH4®, Microzal® and Incospect IC 22XA) although they are not proven to be environmentally safe; they are the most powerful disinfectants because of the synergistic action of the quaternary ammonium and gluteraldhyde bases.

Key words: Disinfectants, evaluation, bacterial pathogens, broiler
Seasonal Epidemiological Surveillance on Bacterial and Fungal Pathogens in Broilers Farms in Egypt

Abstract: A total of 1664 environmental samples (litter, water, swabs and air) were collected from commercial broiler farms located in Ismailia and Zagazig Governorates, Egypt. The bacterial and Fungal isolates that were identified included: *Citrobacter*, *E. coli*, *Klebsiella oxytoca*, *Proteus vulgaris*, *Pseudomonas aureginosa*, *Salmonella*, *Shigella*, *Staphylococcus aureus*, *Streptococcus faecalis* and *Streptococcus pneumoniae*, *Yeast Sp*, *Penicillium Sp*, *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus nidulans*, *Mucor* and *Candida albicans*. Prevalence and frequencies of the microorganisms were calculated to detect the most predominant microorganisms. Litter samples showed that *Pseudomonas aureginosa* (24%) and *Yeast Sp* (37.5%) predominated in closed houses; *Klebsiella oxytoca* (12%) and *Penicillium Sp* (26.57%) predominated in open houses in winter. *Klebsiella oxytoca* (35.33%) and *Aspergillus nidulans* (22.73%) predominated in closed houses; *E. coli* (50%) and *Penicillium Sp* (21.40%) in open houses in spring. *Shigella Sp* (34.5%); (47.62%) and *Aspergillus niger* (26.92%); (8.69%) predominated in closed and open houses respectively in summer. *Klebsiella oxytoca* (55.56%) and *Aspergillus niger* (12%) predominated in closed houses; *Klebsiella oxytoca* (41.67%) and *Candida albicans* (59.1%) predominated in open houses in summer. Water samples showed that *E. coli* (39.47%) and *Candida albicans* (50%) predominated in closed houses; *E. coli* (60.97%) and *Penicillium Sp* (80%) predominated in open houses in winter. *E. coli* (67.57%) and *Penicillium Sp* (37.5%) predominated in closed houses; *E. coli* (89.29%) and *Aspergillus nidulans* (15.63%) predominated in open houses in spring. *Shigella Sp* (42.55%) and *Penicillium Sp* (37.5%) predominated in closed houses; *Shigella Sp* (36.57%) and *Yeast Sp* (69.6%) predominated in open houses in summer. *Klebsiella oxytoca* (36.59%) and *Candida albicans* (33.3%) predominated in closed houses; *Klebsiella oxytoca* (47.22%) and *Candida albicans* (47.62%) predominated in open houses in autumn. Swab samples showed that *Pseudomonas aureginosa* (62.5%) and *Penicillium Sp* (29.41%) predominated in closed houses. *Pseudomonas aureginosa* (47.06%) and *Candida albicans* (17.64%) predominated in open houses in winter; *Klebsiella oxytoca* (36.49%) and *Aspergillus flavus* (43.48%) predominated in closed samples; *E. coli* (43.48%) and *Aspergillus flavus* (46.51%) predominated in open houses in spring; *Klebsiella oxytoca* (26.98%) and *Penicillium Sp* (34.48%) predominated in closed houses; *E. coli* (35.17%) and *Aspergillus niger* (35.14%) predominated in open houses in summer. *Pseudomonas aureginosa* (31.75%); (42.31%) and *Candida albicans* (40.32%); (61.4%) predominated in closed and open houses respectively in autumn. Air samples showed that *staphylococcus aureus* (51.72%-45.45%, 52%-56.17%, 59.52-68.44 and 48.79-75%) was predominating in closed and open houses respectively in winter, spring, summer and autumn respectively, while the fungal growth showed that *Aspergillus niger* (66.6%) predominated in closed houses in winter, *Aspergillus niger* (100%) predominated in closed houses in autumn, *Aspergillus flavus* (100%) predominated in open houses in spring, *Aspergillus niger* (100%) predominated in closed houses in summer, *Aspergillus niger* (100%) predominated in closed and open houses in autumn.