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Effect of Chemical Treatments on Microflora Species on Eggshell and Hatchability of Broiler Eggs

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Abstract

This study was conducted to determine the effect of three disinfectants on the microbes and hatchability of broiler eggs. One hundred and ninety-two medium-sized hatchable broiler eggs were divided into four groups with three replications of sixteen eggs each. Each group of the eggs was assigned to each of the following treatments; untreated, NaOCl, H_2O_2 and $KMnO_4$:HCHO combination (1:2). The eggs were incubated for 21 days. Data were analyzed using one-way analysis of variance in a completely randomized design. The bacteria isolated were *Escherichia coli* (225-390cfu/ml), *Pseudomonas aeruginosa* (78-139cfu/ml), *Staphylococcus aureus* and *Proteus mirabilis* (210-368cfu/ml), *Salmonella* spp (258-313cfu/ml) and fungi (63-101cfu/ml). Significant ($P<0.05$) variation was observed in the population of microflora species on egg shell. *Escherichia coli* were the pre-dominant bacteria recovered from all the samples before treatment. Effect of disinfectants on the microorganisms varied significantly ($P<0.05$) with $KMnO_4$ + formaldehyde combination having the highest (57.36%) effect on *Salmonella* spp. Similar effect of NaOCl and H_2O_2 was observed on S. *aureus* and *Proteus mirabilis, E. coli, P. aeruginosa* and fungi. Eggs treated with $KMnO_4$ + formaldehyde combination had the least significant ($P<0.05$) incubation weight losses value (14.63%), while eggs treated with H_2O_2 had the highest value (17.00%). The results further showed that hatchability, chick hatching weight and early embryonic mortality were not significantly ($P>0.05$) affected by the treatments unlike the late embryonic mortality which was significant ($P<0.05$). Although, $KMnO_4$ + formaldehyde combination is commonly used in the hatchery, in this experiment NaOCl and H_2O_2 compared favourably with formaldehyde as hatching disinfectants without adversely affecting hatching potentials.

Key words: Disinfectant, microbes, egg shell, hatchability, broiler