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Isolation and Identification of Non-coliform Gram-negative Bacteria in Hatching Eggs to Evaluate the Effect of Egg Fumigation by Formaldehyde

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Non-coliform gram-negative bacteria like *Salmonella, pseudomonas and proteus* are the causes of yolk sac infection. In this study, we evaluated the effect of formaldehyde on the reduction rate of egg shell, yolk and yolk sac contamination.
Two hundred and forty hatching eggs from a broiler breeder farm and hatchery as well as sixty newly-hatched chicks (5 stages) were selected for bacteriological examinations. Stages include: Stage 1: Before cleaning and first disinfection, Stage 2: After first disinfection, Stage 3: Before setting inside the setter, Stage 4: Time of transferring from setter to hatcher, Stage 5: Newly-hatched chicks.
Alcaligenes faecalis was isolated from 18.3%, 11.7%, 8.3% and 10.0% of egg shells from stages 1 to 4 respectively and it was also isolated from 11.7% of yolk sacs. Non-coliform gram-negative bacteria were not isolated from yolks in any stages. Based on this research the existence of non-coliform gram-negative bacteria on the hatching egg shells is normal. Immediately egg collection after laying and proper disinfection with formaldehyde can lead

to a significant reduction of non-coliform gram-negative bacteria with which the risk of bacteria penetration in to the yolk will decrease dramatically. Formaldehyde is usually effective in reducing non-coliform gram-negative contamination, however, in this study it could not affect significantly (p=0.323) on these contaminations, which maybe due to the fact that the bacteria were in the form of spores. The reduction of contamination rate was significant (p=0.049) only between stages 1and 3 which can be attributed to secondary fumigation by formaldehyde.

Keywords: formaldehyde, hatching eggs, isolation, non-coliform bacteria

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