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Chemical and Microbiological Contaminants in Table Eggs

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**Hygiene and Control of Milk, Milk Products, Fats&Oils and
Eggs**

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7. Summary

A total of 366 table egg samples (pooled samples) including farm, native and organic table egg were collected from Ismailia governorate, Egypt for analysis. 153 for microbiological analysis (egg shell and egg content), 153 for chemical analysis and 60 for experiment. The collected samples were transferred immediately without delay to laboratory under complete aseptic conditions in clean vessels.

All samples were evaluated microbiologically and chemically.

1. Microbiological examination:

1. Total aerobic count:

The mean values of total aerobic count in examined farm, native and organic egg shell were 2.5×10^5 , 1.4×10^5 and 2.9×10^3 CFU/ml respectively. While the mean values of total aerobic count in examined farm, native and organic egg content were 6.5×10^3 , 5.4×10^3 and 1.0×10^3 CFU/ml respectively.

2. Total *coliform* count:

The mean values of total *coliform* count in examined farm, native and organic egg shell were 1.9×10^2 , 2.4×10^2 and 1.0×10^2 CFU/ml respectively. While the mean values of total *coliform* count in examined farm, native and organic egg content were 2.9×10^1 , 3.1×10^1 and 1.1×10^1 CFU/ml respectively.

3. Total *Staphylococcus* count:

The mean values of total *Staphylococcus* count in examined farm, native and organic egg shell were 2.4×10^3 , 2.2×10^3 and 1.9×10^2 CFU/ml respectively. While the mean values of total *Staphylococcus* count in examined farm, native and organic egg content were 1.9×10^1 , 2.5×10^1 and 1.4×10^1 CFU/ml respectively.

4. Total yeast and mould count:

The mean values of total yeast and mould count in examined farm, native and organic egg shell were 6.9×10^1 , 5.7×10^1 and 1.1×10^2 CFU/ml respectively. While

the mean values of total yeast and mould count in examined farm, native and organic egg content were 1.3×10^1 , 2.0×10^1 and 1.9×10^1 CFU/ml respectively.

Detection of *Salmonella*:

The incidence of *Salmonella* were 2(11.67%) in farm egg shell samples which serotyped to *S.Typhimurium* 1,4,(5) ,12:i:1,2 and *S.Kentucky* 8,20:i:z. and 2(11.67%) in native egg shell samples which serotyped to *S.Enteritidis* 1,9,12:g,m:- and *S.Typhimurium* 1,4,(5) ,12:i:1,2 and 0(0.0%) in organic egg shell samples.

Salmonella couldn't be detected in farm, native and organic egg content samples.

Detection of *E.coli*:

The incidence of *E.coli* were 5(29.41%) in farm egg shell samples which serotyped to *O*_{25:K11} , *O*_{44:K74} and *O*_{128:K67}. and 5(29.41%) in native egg shell samples which serotyped to *O*_{119:K67} , *O*_{44:K74} , *O*_{119:K69} and *O*_{158:K} . and 2(11.67%) in organic egg shell samples which serotyped to *O*_{128:K67} and *O*_{126:K71}.

The incidence of *E.coli* were 2(11.67%) in farm egg content samples which serotyped to *O*_{25:K11} and *O*_{44:K74}. and 1(5.88%) in native egg content samples which serotyped to *O*_{128:K67}. and 0(0%) in organic egg content samples.

2. Chemical examination:

1. Heavy metal residues:

The mean levels of lead content of farm, native and organic table hen's egg samples are 0.010 ± 0.002 , 0.019 ± 0.003 and 0.036 ± 0.004 ppm respectively. All of the examined table hen's egg samples are within the permissible limits.

The mean levels of cadmium content of farm, native and organic table hen's egg samples are 0.004 ± 0.001 , 0.012 ± 0.001 and 0.016 ± 0.002 ppm respectively. All of the examined table hen's egg samples are within the permissible limits.

2. Antibiotic residues:

Tetracyclines and Erythromycin cannot be detected from any of the examined table hen's egg samples. All of the examined table hen's egg samples are within the permissible limits.

3. Experimental study (the effect of spray egg shell by acetic acid spray on total aerobic count and total *Staphylococcus* count):

The mean aerobic count in control group: 1.7×10^3 , 7×10^3 , 5×10^4 , 1×10^5 and 2×10^6 CFU / ml. at Zero day, 1st wk, 2nd wk, 3rd wk and 4th wk, respectively. While the mean aerobic count in acetic acid group: 1.2×10^3 , 3×10^3 , 4×10^3 , 5×10^4 and 3×10^5 CFU / ml. at Zero day, 1st wk, 2nd wk, 3rd wk and 4th wk, respectively.

The mean *Staphylococcus* count in control group: 2×10^2 , 2×10^2 , 3×10^3 , 4×10^3 and 3×10^4 CFU / ml. at Zero day, 1st wk, 2nd wk, 3rd wk and 4th wk, respectively. While the mean *Staphylococcus* count in acetic acid group: 1×10^2 , 1×10^2 , 3×10^2 , 2×10^3 and 1×10^4 CFU / ml. at Zero day, 1st wk, 2nd wk, 3rd wk and 4th wk, respectively.