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PREVALENCE OF LISTERIA SPECIES IN HEN'S EGGS SOLD IN ASSIUT CITY

(With 2 Tables)

By

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مدى تواجد ميكروب الليستيريا فى بيض الدجاج

نجاح سعد ، ايناس البرنس

يعتبر بيض الدجاج من أهم المصادر الغنيه بالبروتين الحيوانى ، زبالرغم من ذلك فانه عرضه للتلوث بأنواع مختلفه من الميكروبات والتى قد تصل اليه من مصادر متعدده منذ انتاجه وأثناء توزيعه حتى يصل الى المستهلك , وبالتالى يصبح مصدرا لنقل الأمراض ومن هذه الأمراض ال Listeriosis والذى يسببه ميكروب L.monocytogenes. ولأهمية هذا الميكروب تمت هذه الدراسه لمعرفة مدى تلوث البيض ب Listeria species وشملت فحص ٢٢٥ عينه جمعت عشوائيا من أسواق مدينة أسيوط ومزارع الدواجن المعده للاستهلاك الادمى ، وقد أمكن عزل ميكروبات L.seeligeri/ L. ivanovii , L.innocua / L.monocytogenes من ٨ (٧٧ ر٣٪) ، ١٦(٥٥ ر٣٥٪) ، ٢(٤٤ ر٤٪) ، ٥(١١ ر١١٪) عينات من قشر البيض ، على التوالى . أما فى حالة محتويات البيض ، فقد أمكن عزل ميكروب L.innocua من ثلاث عينات فقط بنسبة ٦٦ ر٦٪ . ويتضح من هذه الدراسه أن قشر البيض أكثر تلوثا بميكروب الليستيريا . وقد نوقشت الطرق الواجب اتباعها لمنع تلوث البيض بهذا الميكروب .

SUMMARY

A total of 225 random eggs, representing 45 groups, were collected from Assiut City markets, poultry farms as well as from farmer's houses and examined for the presence of listeria species. Out of 45 examined egg shell samples, 8(17.77%), 16(35.55%), 2(4.44%) and 5(11.11%) contained *L. monocytogenes, L. ivanovii, L. innocua, L. seeligeri,* respectively. While in case of examined egg contents, *L.innocua* could be isolated from 3 samples only (6.66%), however, the other species failed detection. It is apparent that egg shells were more contaminated with *L. species* than egg contents. The public health hazards of listeria species and the suggestive measures were discussed.

Keywords: *Prevalence, Listeria spp., hen's egg, Assiut City.*

INTRODUCTION

The genus Listeria is composed of eight species, of which *Listeria monocytogenes, Listeria innocua, listeria welshimeri, Listeria seeligeri* and *Listeria ivanovii* were identified and appeared to be widely distributed in nature. *Listeria monocytogenes*, the aetiologic agent of Listeriosis, is the significant human pathogen. Listeria infections were first reported in Europe before the turn of the century *(GRAY and KILLINGER, 1966)* and since that time a gradual awareness of their occurrence in both animals and humans spread throughout most of Europe and North America although interest remained at a level which was low compared with other pathogens. The importance of *Listeria monocytogenes* as an agent of foodborne disease has become increasingly apparent.

Listeria monocytogenes has been receiving increasing attention from the food industry. It is pathogenic for man and has been associated with food-borne infections. Typical symptoms of Listeriosis are septicaemia, meningitis or abortion, which occur most commonly in neonates and immunosuppressed patients *(FLEMING et al., 1985). Listeria monocytogenes* is widely distributed in foods and has been isolated from commercially broken, raw, liquid whole eggs *(LEASOR and FOEGEDING, 1989)*. Its presence in eggs most likely is due to contamination from the shells during the breaking process or from the environment. *FOEGEDING and LEASOR (1989)* found 2 of 42 samples contained *Listeria monocytogenes. Listeria monocyto-genes* has been reported to grow in eggs *(WOODBINE, 1975)*. Contaminated eggs may pose a health threat to humans in some lightly cooked or uncooked egg-based products. Furthermore, *Listeria monocytogenes* survives freezing (Foegeding and Stanely, unpublished data) and may grow upon thawing of the eggs. *Listeria seeligeri* and *Listeria welshimeri* have been documented recently to cause infections in human *(ROCOURT et al., 1986 and ANDRE and GENICOT, 1987)*.

Therefore, the aim of the work reported here was to investigate the incidence of Listeria species in marketable hen's eggs.

MATERIAL and METHODS

Samples collection:

A total of 225 random eggs (45 groups) were collected from Assiut City markets, poultry farms as well as from farmer's houses. Every 5 eggs (one group) were placed in a sterile plastic bag and dispatched to the laboratory with a minimum of delay where they were prepared and examined for the presence of *Listeria monocytogenes* and other listeria species.

Sample preparation:

* *Egg shells:* Egg shells were tested by a surface rinse method as described by *MOATS (1979)*.

* *Egg contents:* The egg was prepared for evacuation of its content according to *Speck (1976).*

* *Enrichments procedure:* 1 ml of rinse solution as well as from the homogenous egg contents was placed aseptically in the enrichment broth, Tryptose broth containing 40 µg/ml Nalidixic acid and 30 u/ml Polymyxin B sulphate, as described by *HOFER (1983),* then incubated at 37°C for 24 hours.

* *Isolation and identification:* A loopful of enrichment broth was streaked on Tryptose agar supplemented by 40 µg/ml Nalidixic acid and 30 u/ml Polymyxin B sulphate. The plates were incubated at 37°C for 24 hours. Species differentiation were done according to *JOHNSON et al., 1990,* including carbohydrate fermentation, B-hemolysis on blood agar and CAMP test.

RESULTS

The obtained results were recorded in Tables 1 and 2.

Table 1: Incidence of Listeria species recovered from the examined egg shells.

Listeria spp.	Positive samples	
	No/45	Percentage
L. monocytogenes	8	17.77
L. innocua	16	35.55
L. ivanovii	2	4.44
L. seeligeri	5	11.11

DISCUSSION

From the results recorded in Table 1, it is evident that egg shells were found to have listeria species. From the examined 45 egg shell samples, 8 samples(17.77%)contained *L. monocytogenes,* 16 samples (35.55%) contained *L.innocua,* 2 samples (4.44%) contained *L. ivanovii and* 5 samples (11.11%) contained *L. seligeri.*

Table 2: Incidence of Listeria species recovered from the examined egg contents.

Listeria spp.	Positive samples	
	No/45	Percentage
L.monocytogenes	0	0
L. innocua	3	6.66
L. ivanovii	0	0
L. seeligeri	0	0

The higher incidence of *L. innocua* is in accordance with those recorded by *PETRAN and SWANSON (1993) as they* stated that, *L.innocua* was found more frequently than *L. monocytogenes* in a variety of foods. This may be attributed to the competition between the organisms.

The presence of *L. mono-cytogenes* in eggs most likely is due to contamination from the shells during the breaking process or from the processing environment *(FOEGEDING and LEASOR, 1989).*

It would appear from the obtained results in Table 2, that *L. monocytogenes* was not detected in any of 45 egg content samples examined although *L. innocua* only was isolated from 3 samples (6.66%). These findings are very low

compared with those obtained by *FOEGEDING and LEASOR (1989)* who found that 2 of 42 samples (4.76%) of raw,broken, liquid whole egg contained *L. monocytogenes.*

Although the contents of newly laid egg from healthy fowls are usually sterile, yet the shell soon becomes contaminated with microorganisms which can grow and penetrate through its intact shell contaminating the egg contents. The rate of penetration of these organisms influenced by humidity and storage temperature at which the eggs are produced and stored *(SHARP and STEWART, 1936; HAINS and MORAN, 1940 and ROMANOFF and ROMANOFF, 1949).*

The use of listeria species other than *L.monocytogenes* as indicators of the presence of that microorganisms has been proposed *(JOHNSON et al., 1990).*

Many workers suggested that the egg can be easily conta-minated within short period after laying *(LORENZ et al., 1952).* Thus, most eggs receive their first load of contamination at oviposition and it may be considered, therefore, that the major contamination of eggs is of external origin *(BOARD, 1977).* So, control of Listeria infections could be achieved by awareness of the ubiquity of that organism and especially of those environ-ment that favour multi-plication.

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