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## A SURVEY OF SOME SELECTED FOOD ITEMS FOR THE PRESENCE OF *LISTERIA MONOCYTOGENES* AND OTHER *LISTERIA* SPECIES

(With 2 Tables)

By

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مدى تواجد ميكروب الليستيريا مونوسيتيتوجينس والأنواع  
الأخرى في بعض المنتجات الغذائية

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بعض الأغذية التي لا تتعرض لحرارة كافية في إعدادها لها دور خطير في نقل  
كثير من الأمراض ، من هذه الأمراض مرض *Listeriosis* والذي يسببه ميكروب  
*L. monocytogenes* ، ولما لهذا الميكروب من خطورة كبيرة على صحة المستهلك أجريت  
هذه الدراسة لمعرفة مدى تلوث بعض هذه الأغذية بهذا الميكروب ، لذلك تم جمع  
١٠ عينات لانشون ، ٧ عينات سجق ، ٩ عينات برجر ، ١٠٠ عينة جبن قريش ،  
٥٠ عينة جبن دمياطي ، وبفحص هذه العينات أمكن عزل ميكروب *L. monocytogenes* من  
عينة واحدة من السجق وعينة من الجبن القريش وعينة من الجبن الدمياطي ولم يمكن  
عزله من اللانشون أو البرجر . كما أمكن عزل ميكروب *L. innocua* من عينة واحدة  
من السجق ، ٣ عينات من الجبن القريش وعينة واحدة من الجبن الدمياطي . أما  
ميكروب *L. welshimeri* فأمكن عزله من عينة من البرجر وعينة من الجبن القريش .  
وقد تم ذكر الشروط الصحية الواجب إتباعها لمنع تلوث الأغذية بميكروب الليستيريا .

### SUMMARY

Various retail food products were analyzed for the presence of listeria species, including 10 luncheon, 7 sausage, 9 burger, 100 kareish and 50 damietta cheese samples. Out of 7 sausage samples, one (14.20%) was positive for *Listeria monocytogenes*, while the organism failed detection in the examined luncheon and burger samples, and it was found in one sample of kareish (1%) and one of damietta cheese (2%), respectively. However, *Listeria innocua* could be isolated from one (10%), 2(28.57%), 3(3%) and one (2%) of the examined luncheon, sausage, kareish and damietta cheese samples, respectively. *Listeria welshimeri* could be detected in one sample of burger (11.1%) and one sample of kareish cheese (1%). The public health importance of *Listeria* species and the suggestive measures were recommended.

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## INTRODUCTION

*Listeria monocytogenes* is a foodborne pathogen which has lately been a cause of great concern not only for the food industry but also for regulatory agencies as well FARBER and LOSOS (1988) and WHO (1988). *Listeria monocytogenes* is widely distributed in the environment, it has been isolated from soil, water and animals and occurs widely in various fresh foods such as raw milk and meats (BRACKETT, 1988).

*Listeria monocytogenes* is associated with meningoencephalitis, septicemia, pneumonia, endocarditis, urethritis and abortion (GRAY and KILLINGER, 1966).

The pathogen has been isolated from food processing environment (COX *et al.* 1989) and finished food products (ANONYMOUS, 1987).

The World Health Organization, in its recommendations to the food industry regarding *Listeria*, stressed the importance of gathering information about the ability of various food to support growth of the pathogen (WHO, 1988).

Meat and dairy products as well as varieties of other foods, the processing of which does not include a final listeriocidal heat treatment are now widely recognized as possible sources of foodborne listeriosis (JAMES *et al.*, 1983 and SCHLECH *et al.*, 1983). Although *L. monocytogenes* has been primarily associated with dairy products, it is associated also with food animals used for human consumption (BRACKETT, 1988) and has been isolated from ground beef (NICHOLAS, 1985). In 1987, the Food Safety Inspection Service initiated a survey of meat products to determine the extent of contamination at the retail level. NICHOLAS and VIDAUD (1978) found *L. monocytogenes* in 26% of samples of frozen minced meat, whereas the incidence in ground beef varied from 28% (SKOVGAARD and MORGEN, 1988) to 58% (TRUSCOTT and McNAB, 1988). FARBER *et al.* (1989) found that 38 of 44(86.4%) ground meats and 6 of 30(20%) of sausages contained the organism.

The presence of *L. monocytogenes* in milk products has been documented. It has been isolated from various milk products in the market place. The pathogen behaves differently in different kinds of cheese, it survived for more than one year in CHEDDAR, 140 days in Colby, 90 days in Feta, and grow in Camembert chesse (EL-GAZZAR and MARTH, 1991).

RODLER and KORBNER (1989) isolated *L. monocytogenes* from 2% of examined cheese samples. HIRD (1987) stated that *L. monocytogenes* was recovered from a sour cream like product and cottage cheese by-products. *Listeria ivanovii* is another pathogenic species usually associated with sheep. In addition, a variety of *Listeria* species has been found in meat and meat products. Isolation of *L. innocua* from meat is common and the incidence of this organism is higher than the incidence of *L. monocytogenes* (BREER & SCHOPFER, 1980 and BREUER & PRANDL, 1988). *Listeria*

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seeligeri and *L. welshimeri* have been documented recently to cause infections in human (ROCURT *et al.*, 1986 and ANDRE & GENICOT, 1987).

The use of *Listeria* species other than *L. monocytogenes* as indicators of the presence of that organism has been proposed WHO (1988).

Therefore, this investigation is to survey some food products for the presence of *L. monocytogenes* and other *Listeria* species.

### MATERIAL and METHODS

Food samples which included 10 luncheon, 9 burger, 7 sausage, 50 damietta and 100 kareish cheese were collected from retail local markets and supermarkets and examined for the presence of *Listeria monocytogenes* and other *Listeria* species.

#### Enrichment procedure:

10 g of each food product were placed aseptically in an enrichment broth consisting of Tryptose broth containing 40 Ug/ml Nalidixic acid and 30 u/ml Polymyxin B sulphate as described by HOFER (1983). The broth was incubated at 37°C for 24 h.

#### Isolation and identification of *Listeria* species:

After incubation a loopful of enrichment broth was streaked on the surface of Tryptose agar supplemented by 40 Ug/ml Nalidixic acid and 30 u/ml Polymyxin B sulphate and incubated at 37°C for 24 h. Colonies resembling those of *Listeria* were Gram stained. Confirmatory tests were done on each isolate suspected to be *L. monocytogenes* as described by SEELIGER (1961) and LOVETT (1988). Mouse pathogenicity testing was performed to confirm *L. monocytogenes* according to SEELIGER and JONES

### RESULTS

The obtained results were recorded in Tables (1 & 2).

### DISCUSSION

The results in Table (1) revealed that *L. monocytogenes* could be detected in 1(14.28%) of sausage, 1(1%) kareish and 1(2%) damietta cheese samples, while none of the analyzed luncheon and burger samples were found to contain *Listeria monocytogenes*. These results are nearly similar to those of JOHNSTON *et al.* (1988) who

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found that 5 of 42 samples of fermented sausage were positive for *L. monocytogenes* after drying. Sausage fermentation and drying process can be regarded as means of reducing, but not eliminating *Listeriae* from sausage (GLASS and DOYLE, 1989).

Higher results were recorded by FARBER *et al.* (1989) who showed that 6 of 30(20%) fermented sausage contained the organism.

Concerning cheese samples, similar results were obtained by RODLER and KORBNER (1989) and GARAYZABAL and GENIGEORGIS (1990). *L. monocytogenes* has been reported to survive during manufacture and store of some cheese varieties (STAJNER *et al.*, 1979).

As shown in Table (2), all *Listeria* isolates from food samples were identified as *L. monocytogenes*, *L. innocua*, and *L. welshimeri*. It is clear that 1(10%) of luncheon, 2(28.57%) sausage, 3(3%) kareish cheese and 1(2%) damietta cheese samples were positive for *L. innocua*. *Listeria innocua* was previously isolated from meat, and its incidence is higher than the incidence of *L. monocytogenes* (BREER AND SCHOPFER, 1988).

However *L. welshimeri* could be isolated from 1(11.1%) burger and 1(1%) kareish cheese samples. VANDERLINE and GRAU (1991) recorded higher results. *L. innocua* and *L. monocytogenes* were previously isolated from beef roast by SKOVGAARD and MORGEN (1988).

The use of any *Listeria* species as an indicator of the presence of *L. monocytogenes* has been proposed (JOHNSTON *et al.*, 1990).

In the meantime, control of listeriosis could be achieved by an awareness of the ubiquity of the organism and especially of those environments that favour multiplication. Thus, the collaboration of medical, veterinary and food bacteriologists; farmers, food manufacturers, and technologists is essential.

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Table (1): Isolation of *Listeria monocytogenes* from some food products

Type of samples	No. of examined samples	Positive samples	
		No.	%
Luncheon	10	0	0
Sausage	7	1	14.28
Burger	9	0	0
Kareish cheese	100	1	1
Damietta cheese	50	1	2

Table (2): Isolation of *Listeria* species from some food products

Type of samples	No. of examined samples	No. of positive samples					
		<i>L. monocytogenes</i>		<i>L. innocua</i>		<i>L. welshimeri</i>	
		No.	%	No.	%	No.	%
Luncheon	10	0	0	1	10	0	0
Sausage	7	1	14.28	2	28.57	0	0
Burger	9	0	0	0	0	1	11.1
Kareish cheese	100	1	1	3	3	1	1
Damietta cheese	50	1	2	1	2	0	0