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**PUBLIC HEALTH SIGNIFICANCE OF COLIFORMS  
IN RAW MILK AND DOMIATI CHEESE**  
(With 2 Tables)

By

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الأهمية الصحية للميكروبات القولونية في اللبن الخام والجبن الدمياطي  
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تم الفحص البكتريولوجي لمائة عينة من اللبن الخام والجبن الدمياطي (٥٠ من كل نوع) جمعت من مصادر مختلفة من أسواق القاهرة والجيزة وضواحيها لتحديد مدى تلوثها بالميكروبات القولونية. وقد أثبتت النتائج عن تواجد ميكروبات الكوليفورم في جميع عينات اللبن الخام بمتوسط عدوى  $38.30 \times 10^6$ . كما تواجدت تلك الميكروبات في ٦٦٪ من عينات الجبن الدمياطي بمتوسط قدره  $36.98 \times 10^6$ . وقد أمكن عزل ميكروب الايشيريشياكولاى *E. coli* بنسبة ٢٢٪ ، ٥١٪ من عينات اللبن الخام والجبن الدمياطي على التوالي. كما أمكن عزل: *E. coli*, *Enterobacter cloacae*, *Ent. aerogenes*, *Ent. agglomerance*, *Ent. gergoviae*, *Citrobacter amalonaticus*, *Cit. diversus*, *Cit. freundii*, *Klebsiella oxytoca*, *K. ozaenae*, *K. rhinoschleromatis* and *K. pneumoniae*.

بنسب مختلفة من عينات اللبن الخام والجبن الدمياطي. هذا وقد تناول البحث مناقشة أهمية الميكروبات المعزولة وعلاقتها بالصحة العامة.

**SUMMARY**

One hundred random samples of market raw milk and Domiati cheese (50 each) collected from different localities in Cairo and it's suburbs were examined bacteriologically for detection, count, isolation and identification of coliforms.

All examined raw milk samples proved to be contaminated with coliform organisms with a mean value of  $38.30 \times 10^6$ . On the other hand 33 out of the 50 Domiati cheese samples were contaminated with coliforms with a mean value of  $36.98 \times 10^6$ .

*E. coli*, *Enterobacter cloacae*, *Ent. aerogenes*, *Ent. agglomerance*, *Ent. gergoviae*, *Citrobacter amalonaticus*, *Cit. diversus*, *Cit. freundii*, *Klebsiella oxytoca*, *K. ozaenae*, *K. rhinoschleromatis* and *K. pneumoniae* could be identified from examined raw milk and Domiati cheese samples of various percentages.

The public health importance of isolates has been discussed.

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**INTRODUCTION**

Milk and its products are liable to contamination from different sources during production, handling and distribution. Coliform organisms stand first among food contaminants as they are widely spread in nature. Some of these contaminants induce certain objectionable changes in the product while others play a pathogenic role among consumers.

Contamination of dairy products with coliforms is used to ascertain the standard of sanitation maintained during production. Moreover, some organisms are frequently implicated in different affections among consumers.

The present investigation deals with the rate of contamination of both raw milk and Domiati cheese with coliform organisms.

**MATERIAL and METHODS**

Fifty random samples each of market raw milk and Domiati cheese were collected from different localities in Cairo and its Suburbs. Milk samples were subjected to Guaiac test (SCHONBERG, 1956), heat treated samples were discarded. Raw milk and Domiati cheese samples were prepared according to A.P.H.A. (1985).

Prepared samples were bacteriologically examined for determination of coliforms content (MPN/100 ml or gm) according to the technique recommended by A.P.H.A. (1985). Isolated purified colonies of coliforms were identified morphologically and biochemically according to KRIEG and HOLT (1984).

**RESULTS**

All results obtained are recorded in Tables (1 & 2).

Table (1): Statistical analytical results of coliform content (MPN/100 ml or gm) in examined samples.

	Positive samples		Minimum	Maximum	Mean	S.E.M. $\pm$
	No.	%				
Raw milk	50	100	$33 \times 10^2$	$13 \times 10^9$	$38.30 \times 10^7$	$26.87 \times 10^7$
Domiati cheese	33	66	$24 \times 10^2$	$24 \times 10^7$	$36.98 \times 10^6$	$12.45 \times 10^6$

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Table (2): Incidence of isolated coliforms from examined positive samples.

Isolates	Raw milk		Domiaty cheese	
	No. of samples	%	No. of samples	%
<i>Escherichia coli</i>	16	32	5	15.151
<i>Enterobacter cloacae</i>	11	22	4	12.121
<i>Ent. aerogenes</i>	9	18	7	21.212
<i>Ent. agglomerans</i>	20	40	3	9.090
<i>Ent. gergoviae</i>	2	4	1	3.030
<i>Citrobacter amalonaticus</i>	14	28	10	30.300
<i>Cit. diversus</i>	11	22	10	30.300
<i>Cit. freundii</i>	14	28	4	12.121
<i>Klebsiella oxytoca</i>	16	32	19	57.575
<i>K. ozaenae</i>	10	20	5	15.151
<i>K. rhinoschleromatis</i>	16	32	8	24.242
<i>K. pneumoniae</i>	7	14	1	3.030

## DISCUSSION

## Coliform content :

Results given in Table (1) reveal that all samples of raw milk proved to be highly contaminated with coliforms, the maximum coliform content (MPN/100 ml) was  $13 \times 10^9$ , the minimum was  $33 \times 10^2$ , with a mean value of  $38.30 \times 10^7$ . Nearly similar counts were reported by MOAWAD (1988) and ABDEL-HADY (1989).

It is also clear from the results recorded that coliform organisms could be isolated from 33 out of the 50 Domiaty cheese samples examined with a mean count of  $36.98 \times 10^6/100$  gm (Table 1). Nearly similar findings were reported by SAUDI (1980) and ABDEL-RAHMAN (1988).

## Isolated coliforms :

*E.coli* could be isolated from 32% and 15.151% of examined raw milk and Domiaty cheese samples respectively, while *Enterobacter cloacae*, *Ent. aerogenes*, *Ent. agglomerans*, *Ent. gergoviae*, *Citrobacter amalonaticus*, *Cit. diversus*, *Cit. freundii*, *Klebsiella*

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oxytoca, K. ozaenae, K. rhinoschleromatis and K. pneumoniae could be isolated from examined raw milk and Domiati cheese samples at varying percentages ranging from 3.030% to 57.575% (Table 2). These findings substantiate what have been recorded by ABD-EL-RAHMAN (1988) and MOAWAD (1988).

The public health importance of isolated coliforms has been reported by many authors. E.coli have been incriminated in urinary tract infection, peritonitis and wound infection. Klebsiella pneumoniae may be responsible for bronchopneumonia, pyaemia and cystitis, while K. ozaenae was found in cases of ozaenae in man. Citrobacter freundii and Enterobacter species were incriminated in urinary tract infection and septicemia (BALLY & SCOTT, 1974; PYATKIN & KIRVOSHEIN, 1980; KRIEG & HOLT, 1984 and ICMSF, 1986).

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