قسم الرقابة الصحيـــة على الاغذيـــة
كلية الطب البيطري - جامعة القاهـرة
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كلوستريديـــم برفرينجينـــــس
فى اللبن الجـــاف

رجاء شحاته ، حسام فـــاروق

أجريت التجارب على خمسون عينة من اللبن الجاف جمعت من مصادر مختلفة مـــن القاهرة وضواحيها لتحديد مدي تلوثها بالميكروبات اللاهوائية (الكلوستريديا) لاسيمـــا كلوستريديم برفرينجينس ٠

ودلت النتائج على تواجد الكلوستريديم فى ٢٨٪ من العينات المفحوصة وكان متوســط عددها فى المليمتر ٣٨,٥٧+٢,١٧ ٠ وتم عزل كلوستريديم برفرينجينس من ١٦٪ مـن العينـات أما ميكروبات كلوستريديم اوكانيكوم ، كلوستريديم بيفرمينتانز وكلوستريديم كادا فـيرس تـم عزلهم بنسب تراوحت بين ٤٪ الى ١٢٪ من العيبنات ٠

وقد أسفر لتصنيف السيرولوجى لعترات الكلوستريديم برفرينجينس عن انتمائها لنوعـين سيرولوجين همـا أ،د ٠

وقد تمت مناقشة الاهمية الصحية لتواجد ميكروب الكلوستريديم برفرينجينس فـى اللـبن الجاف ٠

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CLOSTRIDIUM PERFRINGENS IN DRIED MILK

(With 5 Tables)

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SUMMARY

Fifty random samples of different brands of milk powder were collected from different localities in Cairo and its subrubs to be examined for incidence, enumeration, isolation and identification of clostridia.

Examination of samples revealed the presence of clostridial organisms in 28% of examined samples with a mean count of 38.57 - 3.17/ml.

Cl.perfringens proved to be present in 16% of examined samples while Cl.oceanicum, Cl.bifermentans and Cl.cadaveris were present at variable percentages ranging from 4% to 12%.

Serological identification of Cl.perfringens proved the toxigenicity of 4 strains, two strains belonged to type "A" and the other two strains belonged to type "D".

The economic and public health importance of isolated clostridial organisms as well as suggested measures for improving the quality fo the product have been discussed.

INTRODUCTION

Clostridium organisms are widely distributed in nature. Their presence in milk and dairy products is commonly accepted as an index of faecal or soil contamination.

Several types of clostridium organisms have been reported to induce different types of unfavorable changes in dried milk as hard swell spoilage (ASHTON, 1981). Moreover Cl.perfringens has been implicated in an outbreak of food poisoning due to consumption of milk powder (ANON, 1982). Therefore this investigation was conducted to illustrate the incidence of Cl.perfringens in market dried milk.

MATERIAL and METHODS

Fifty random samples of milk powder (of four different brands) collected from different localities in Cairo and Giza, were examined for detection, enumeration and identification of existing clostridial organisms.

Samples were reconstituted and decimal dil. were prepared according to A.P.H.A. 1982. For enumeration of Cl.organisms 0.1 ml. from each dilution was seeded evenly on to dublicated plates of Reinforced Clostridial Medium (RCM). Inoculated plates were incubated anaerobically

using Gas - Pack anaerobic Jar (BREWER and AHGEIER, 1966) at 37°C for 48 hr. Counting and calculation was conducted according to GUDKOV and SHARPE (1966). Isolation technique was adopted after I.C.M.S.F. (1978). While identification of isolates was done according to BUCHANAN and GIBBONS (1975).

Dermonecrotic test in guinea pigs was applied for typing Cl.perfringens (BUHEN, 1952 and OAKIE & WARRACK, 1953). The injected g.pigs were kept under observation for 48-72 hr. to determine any dermal reaction. The results were interpreted by the degree of the dermonecrotic reaction and its neutralization according to STERN and BATTY (1975).

RESULTS and DISCUSSION

Results presented in table (1) show that clostridial organisms could be isolated from 28% of examined samples with a mean count of 38.75 - 3.17/ml. Higher icnidence percent was reported by BURBIANKA (1967).

The highest frequency distribution (50%) lies within the range 40-60 (Table 2). Nearly similar findings were reported by APPUSWAMY and RANGANATHAN (1981).

Cl.perferingens could be isolated from 16% of examined samples, while Cl.oceanicum, Cl. bifermentans and Cl.cadaveris were isolated at varying percentages ranging from 4% to 12% (Table 3).

Similar types of clostridia were isolated from milk powder by BURBIANKA (1967), SUTTON & HOBBS (1969). SELIGMAN (1973). LUECK, et al. (1980) and APPUSWAMY & RANGANATHAN (1981).

Pathogenisty of the isolated strains of Cl.perfringens were recorded in tables (4 & 5). Out of the 8 strains isolated 4 strains (50%) proved to be toxigenic and belonged to types A (2 strains) and D (2 strains).

From public health point of view Cl.perferingens type A is the most important species of clostridia causing food poisoning (WILLIS, 1977). While type D has been implicated in cases of gastroenteritis (KOHN and WARRACK, 1955).

The conclusion derived from the alarming results reported here - in allows to conclude that milk powder may at times iduces gastroentritis and even food poisining among consumers; therefore concerned authorities should take active part to insure a maximum of safty to consumers through strict inspection during production and handling of milk powder.

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Table (1)
Statistical analytical results of Cl.count/ml. of examined samples

Total No. of Samples	Positive		Minimum	Maximum	Mean	SE +
	No	%				
50	14	28	20	70	38.57	3.17

Table (2)
Frequency distribution of examined milk powder samples based on their clostridial count/ml.

Intervals	Frequency	
	No.	%
20-40	6	42.857
40-60	7	50.000
60-80	1	7.143
Total	14	100.000

Table (3)
Incidence of isolated clostridial organisms from examined samples

Isolate	No. of samples	%
Cl.perfringens	8	16
Cl.oceanicum	6	12
Cl.bifermentans	4	8
Cl.cadaveris	2	4
Total	20	40

Table (4)
Incidence of toxigenic Cl.perfringens strains isolated from examined samples

No. of examined samples	Contamined samples with Cl.prefringes		No. of inculated g. p.	Reacting g. p.		Negative reactors	
	No.	%		No	%	No	%
50	8	16	8	4	50	4	50

Table (5)
Differential typing of Cl.perfringens toxigenic strians

Type of isolate	A		B		D		E		A + B		A + D		B + D		B+C+E	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
No. of strains tested	2	50	-	-	2	50	-	-	-	-	-	-	-	-	-	-

N.B.: The percentages were calculated according to the number of toxigenic strains.