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INCIDENCE OF CLOSTRIDIUM PERFRINGENS IN MILK POWDER

(With 2 Tables)

By

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نسبة تواجد ميكروب الكلوستريديم بيرفرنجنز في الألبان المجففة

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تم فى هذه الدراسة فحص ٥٠ عينة عشوائية من الألبان المجففة التى تباع بصيدليات وسوبر ماركت مدينة أسيوط لمعرفة مدى تلوثها بميكروب الكلوستريديم بيرفرنجنز .
وقد دلت النتائج على ان هذا الميكروب موجود بنسبة ١٤% فى العينات المفحوصه وذلك باستخدام طريقة MPN بمتوسط قدره ٤٨ ر.٥٠ جم اما باستخدام طريقة الفرد السطحى على مستنبت SPS فقد كانت نسبة تواجد هذا الميكروب ١٢% بمتوسط قدره ٢٢٧ / جم .
وقد تم مناقشة أهمية تطبيق الاشتراطات الصحيه لضمان سلامة منتجات الألبان للاستهلاك الأدمى .

SUMMARY

A total of 50 random samples of milk powder were collected from different localities in Assiut city and examined for the incidence of *Clostridium perfringens*. *C. perfringens* could be detected in 14% of the examined samples using MPN technique, with an average count of 50.48/g. While on SPS agar the organism was present in 12% of the examined samples, with an average count of 337/g. The public health importance of *C. perfringens* was discussed.

Keywords: Incidence, *Clostridium Perfringens*, milk powder.

INTRODUCTION

Clostridium perfringens is considered to be more widely distributed than any other pathogenic bacterium, occurring in soil, dust and among the intestinal microflora of warm blooded animals (SMITH and HOLDEMAN, 1981). Investigations have shown that about 25% of the human populations excrete the bacterium in the feces. The organism is also found in soil and its spores can survive for long periods in dust and dirt. Consequently, the organism is a common contaminant of raw foods and food ingredients, and because of its ability to produce resistant spores, may persist in low numbers in some processed food products.

Clostridium perfringens is steadily gaining an importance as a pathogen capable of causing foodborne illness. The illness caused by this bacterium is due to eating of food containing a large number of living bacteria which subsequently release toxin in the alimentary canal. HOBBS et al. (1953) stated that the food poisoning strains, which belong to the type A group, are unusually heat - resistant, surviving boiling for periods up to 5 hours

According to standards and limits for microbiological quality reported by WIESE (1992) *C. Perfringens* must be absent from dried and instant foods for infants and young children. On the other hand, many investigators such as BURBIANKA (1965), DOBBERTIN and SIEMS (1975) and EL-BASSIONY (1980) could isolate *C. perfringens* from milk and milk products.

Therefore, the aim of the present work was planned to study the prevalence of *C. perfringens* in the examined samples of milk powder by using Lactose - Sulphite broth (MPN

technique) and plating on Sulphite - Polymyxin - Sulfadiazine (SPS) agar.

MATERIAL and METHODS

A total of 50 random samples of milk powder were collected from different pharmacies and supermarkets in Assiut city for enumeration of *Cl. perfringens*.

Preparation of Samples: was done according to APHA (1985).

Enumeration of *Cl. perfringens*: was performed by using two methods, the first was by applying Lactose - Sulphite broth (LS) using MPN technique and incubation at 46 °C for 18 - 24 h. as described by BEERENS *et al.* (1982), While the second one was by using Sulphite - Polymyxin - Sulfadiazine (SPS) agar, where the plates were incubated in anaerobic conditions for 24 h. at 46 °C as recommended by ANGELOTTI *et al.* (1962). Suspected colonies were picked up for further confirmation according to MEAD *et al.* (1981).

RESULTS

The results were recorded in Tables (1) and (2)

Table (1): Statistical analytical results of *Cl. perfringens* MPN/g of examined milk powder samples

Type of examined samples	No. of examined samples	+ve samples		Count/g		
		No.	%	Min.	Max.	Average
Milk powder	50	7	14	<10	100	50.48

Table (2): Statistical analytical results of *Cl. perfringens*/g of examined milk powder samples using SPS agar.

Type of examined samples	No. of examined samples	+ve samples		Count/g		
		No.	%	Min.	Max.	Average

DISCUSSION

The results outlined in Table (1) indicated that the incidence of *Cl. perfringens* in milk powder was 14% by applying Lactose - Sulphite (LS) broth, with an average count of 50.49/g of the examined samples. The Lactose - Sulphite broth gives good selectivity which allows the detection of low numbers of *Cl. perfringens* in the presence of other sulphite-reducing bacteria. Confirmatory tests not required and the sensitivity of the medium is the most important advantage of the procedure.

Results recorded in Table (2) showed that the level of contamination of milk powder with *Cl. perfringens* was low 12% by plating on SPS agar with an average of 337/g of the examined samples. The thermal processing of milk powder had an effect on lowering the count of *Cl. perfringens*.

Cl. perfringens was previously isolated from milk and some milk products by *EL-BASSIONY (1980)* and *AMER et al. (1986)*. Although *Cl. perfringens* must be absent from dried instant foods for infants (*WIESE, 1992*), the obtained results regarding milk powder samples had the organism.

The probability of food borne illness may occur to human being due to consumption of such products (*JAY, 1978* and *BOUER HERTZ BERGER, 1982*). It was indicated that with improper processing large populations can be present in the final product.

The control of this organism lies mostly in preventing its multiplication by strict time - temperature control and sanitary care of equipments and utensils, as the spores of *Cl. perfringens* can be stimulated to germinate when they are first exposed to sublethal temperatures.

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